

**MONITORING, VERIFICATION AND EVALUATION UNIT
AGRICULTURAL POLICY REFORM PROGRAM**

**MVE UNIT
APRP**

Sponsored by:

**Government of Egypt,
Ministry of Agriculture and Land Reclamation**

**United States Agency for International Development/Cairo
Office of Economic Growth, Agricultural Policy Division**

**A BASELINE OF
APRP
PROGRESS
INDICATORS,
1990-1997**

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USAID Contract No. 263-C-00-97-00003-00

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December, 1999

Monitoring
Report No.2

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LIST OF ACRONYMS

AARI	Aggregate Agricultural Resource Income
ABARE	Australian Bureau of Agricultural and Resource Economics
ARI	Agricultural Resource Income
ALCOTEXA	Alexandria Cotton Exporters Association
APCP	Agriculture Production and Credit Project
APRP	Agricultural Policy Reform Program
CAAE	Central Administration for Agricultural Economics
CAPMAS	Central Agency for Public Mobilization and Statistics
CATGO	Cotton Arbitration and Testing General Organization
cif	Cost, insurance and freight
CIT HC	Cotton and International Trade Holding Company
CY	Calendar Year
ELS	Extra long staple cotton (Gizas 45, 70, 76, 77)
ERSAP	Economic Reform and the Structural Adjustment Program
fob	Free on board
GDP	Gross Domestic Product
GOE	Government of Egypt
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit
HC	Holding Company
HC-SWRMC	Holding Company for Spinning Weaving and Ready Made Clothes
ICAC	International Cotton Advisory Committee
IFDC	International Fertilizer Development Center
IIP	Irrigation Improvement Project
LS	Long-staple cotton (Gizas 75, 85, 86, 89)
MALR	Ministry of Agriculture and Land Reclamation
MPE	Ministry of Public Enterprise
MPWWR	Ministry of Public Works and Water Resources (former name of MWRI)
MTS	Ministry of Trade and Supply
MVE	Monitoring, Verification and Evaluation Unit (APRP)
MWRI	Ministry of Water Resources and Irrigation (formerly MPWWR)
NPC	Nominal Protection Coefficient
PBDAC	Principal Bank for Development and Agricultural Credit
RMG	Ready Made Garment(s)
TCF	Textile Consolidation Fund
TMT-HC	Textile Manufacturing and Trade Holding Company
UD	Universal Density
USAID	United States Agency for International Development
USDA/ERS	United States Department of Agriculture, Economic Research Service
WUA	Water User Association

ACKNOWLEDGMENTS

This report is the work of many dedicated individuals. They are primarily the listed authors, but many others provided assistance. The Chairman of the PPC, Dr. Saad Nassar, has always given his complete support and encouragement to the MVE unit. Eng. Mahmoud Nour provides overall coordination of APRP's work.

The MVE Unit would also like to thank our USAID colleagues for giving us strong support and helpful comments. Thanks go in particular to Drs. Mohamed Omran and Glenn Rogers for their guidance, critical review, and support.

The staff of the MVE unit also deserve credit for their strong support to the authors of this work: our financial manager, Hesham Salah; our administrative assistant, Yvonne Louis Azer, and our data specialist, Flora Naiem Kaddies. Dalia Radwan also helped with preparing the document.

There are individuals too numerous to name who gave their time and effort to make useful information available to the staff and consultants of the MVE Unit. This includes, but is not limited to, individuals in the following institutions: MALR, MWRI, MTS, CATGO, the cotton textile holding companies, Textile Consolidation Fund, ALCOTEXA Information Center, PBDAC, and MPE/Fertilizer Bureau. Some of these individuals hold high positions in the Government; many are in the private sector. All of them have busy schedules. To all we extend our gratitude for their cooperation.

PREFACE

Preparation of this report required a significant investment in MVE Unit management and time, using a number of consultants, to assemble the time-series data from various sources, most notably the MALR (especially CAAE), CAPMAS, MTS, MPE and many other agencies and private companies. These data should be interpreted with caution. Despite this caveat, the Unit feels that these data, once interpreted, provide a reasonably accurate picture of important developments in the agricultural sector and leading subsectors in the agribusiness system.

EXECUTIVE SUMMARY

This report establishes a baseline from 1990 through 1997 (and in some cases longer) of selected progress indicators for APRP, which began in 1996/97. The details of these indicators are given in the report. Because of normal lags in data collection, the indicators generally provide a good picture of the effects of policies and reforms only until the beginning of APRP. Data for a few indicators were available for 1997/98 and for fewer, for 1998/99. Subsequent reports will show better the effects of the reforms implemented under APRP.

This summary describes what the progress indicators show about the immediate effects of the critical agricultural policy reforms that have been undertaken by the GOE since the mid-1980s. The summary is presented in the matrix that follows. The matrix lists each indicator and provides a narrative of the effects that policy reforms during the 1990-97 period seem to have had on the level of the indicator.

Four columns then provide additional assessments. The first and second of these four columns describe the trend of the indicator during the entire period and at the end of the period. This allows one to determine whether the trend was changing by the end of the period. The third and fourth of these four columns give assessments of the relationship between policies implemented during the period and the indicator. Column three assesses the strength of the effect of policies on the indicator, whereas column four treats the direction of the effect of policy on the indicator. Column three addresses the issue of whether it was indeed policy that changed the level of the indicator or exogenous factors.

In addition to the details of the indicators, the report makes a preliminary assessment of the utility of these indicators as progress indicators for APRP (see section 13). Those indicators considered best for continuation as progress indicators for APRP are those that bear a direct relationship to specific reforms under way in APRP. Data can be found to measure these indicators, and their interpretation is generally straightforward. At the other end of the spectrum are indicators that are only indirectly or remotely linked to specific reforms (although they may measure ultimate impact), or complex in themselves and therefore hard to interpret. The MVE Unit is charged with measuring both the short-term effects of APRP (through progress indicators) and the long-run impact of policy reform (through its impact assessment program). Thus it is not necessary to include long-run measures of impact in the progress indicators.

PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING PRE-APRP PERIOD (1990-97)

Indicator	Effects of Policy Reforms	Indicator Trend, Overall	Indicator Trend, Ending	Strength of Policy Effect	Nature of Policy Effect
1.a) Nominal Protection Coefficient, Urea	Fixed ex-factory prices mean that changes in the NPC largely reflect changes in the world price. Removal of subsidies to fertilizer users in the early 1990s was part of the necessary price policy reforms that could lead to closer conformity of domestic and international prices. The most recent world prices are below domestic prices. In this situation, the remaining 30-percent tariff on imports protects inefficient producers of fertilizer and helps to raise the price of fertilizer to farmers. For this reason APRP has recommended lowering of this tariff. The GOE plans to privatize the major fertilizer producer Abu Qir; this might lead to more flexible ex-factory pricing.	Volatile	Improving	Strong	Mixed
1.b) Nominal Protection Coefficient, Rice	Rice production and exports have been positively affected by several policy reforms, but the effects of these are not reflected directly in this indicator. The negative effect of the remaining tariff on potential rice importers, however, is reflected in the NPC. By 1996 and 1997, the domestic price had risen more than 10 percent above the import price of Thai 15% broken rice. APRP has recommended lowering the tariff. This would probably put downward pressure on domestic prices.	Volatile	Worsening	Weak	Negative
2. Correlation coefficient between weekly prices of US Pima & Egyptian Cotton	Despite much progress in liberalizing the production and purchasing of seed cotton, lint export pricing during the 1990-98 period remained quite inflexible. This can best be seen in Figures 2-1 and 2-2, bearing in mind that most export commitments, and therefore price agreements, are made during the early part of the marketing season, from August to about December. APRP has recommended more than once that the GOE allow international prices to balance the supply of and demand for lint in Egypt. As long as inflexible pricing remains, Egypt risks accumulating substantial stocks of cotton and/or incurring large costs to pay farmers more than the world price.	Volatile	Worsening	Strong	Negative

PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING PRE-APRP PERIOD (1990-97), cont'd

Indicator	Effects of Policy Reforms	Indicator Trend, Overall	Indicator Trend, Ending	Strength of Policy Effect	Nature of Policy Effect
3.a) Real value of cotton lint exports	In the decade ending 1997, the real value of cotton lint exports declined by 9.4 percent per year. Cotton lint exports have frequently been hampered by policies, including minimum export prices that are set too high, minimum export grades that are set too high, or by a ban on exports. Exports have been volatile partly because of world supply and demand conditions.	Volatile and Worsening	No Change	Strong	Negative
3.b) Real value of cotton yarn exports	The real value of pure cotton yarn exports declined at 4.5 percent per year. Cotton yarn exports are hindered by some policies, including minimum export prices. Moreover, the difficulty of importing lint (because of a rather rigid phytosanitary policy) restricts the flexibility of spinners and results in lower yarn exports when seed cotton production is lower in Egypt. Like lint exports, exports of yarn have been volatile partly because of world supply and demand conditions.	Volatile	No Change	Strong	Negative
3.c) Real value of cotton RMG exports	The annual growth rate of the real value of pure cotton RMG exports was 8.7 percent. There are no serious policy constraints in this area. The indicator shows a strong rising trend. The US absorbs the vast majority of Egyptian RMG exports.	Improving	No Change	None	N/A ¹
4. Private sector share of distribution of nitrogenous fertilizer	This indicator is a direct measure of the effects of reforms undertaken under APCP and APRP and of an intervening "crisis." After significant progress toward putting fertilizer distribution in private hands, the GOE put it back with PBDAC in 1995/96 before gradually liberalizing again in the aftermath of the problems. By 1997/98 the private share of distribution had surpassed 50 percent. PBDAC no longer takes much fertilizer from the factories, but may retain some sales leverage over farmers (to reduce its stocks) through its provision of credit	Volatile	Improving	Strong	Positive ²

¹I.e., the absence of policy constraints is a positive factor in the growth of RMG exports.

²The effect of policy reform has been positive since APRP began; in the two years before that, policies had a negative effect.

PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING PRE-APRP PERIOD (1990-97), cont'd

Indicator	Effects of Policy Reforms	Indicator Trend, Overall	Indicator Trend, Ending	Strength of Policy Effect	Nature of Policy Effect
5.a) Private sector share of seed cotton trade (volume)	This indicator is a direct measure of changes in cotton marketing and pricing policies. The private sector was allowed to enter this area in 1994/95. Since that time the GOE has made annual changes in policies including especially minimum export prices and qualities, seed cotton floor prices, and deficiency payment schemes that have severely affected the ability and willingness of the private sector to participate in seed cotton marketing, despite a clear desire by many companies and individuals to do so. After reaching more than 50 percent in 1995/96, the private share of seed cotton trade was 20 percent in 1998/99.	Volatile	Improving	Strong	Mixed
5.b) Private sector share of cotton ginning (volume)	The GOE has taken clear steps in the area of privatizing cotton ginning. This is reflected directly in the significant share of lint that is now produced in private gins (about 40 percent in 1998/99). This share could reach 100 percent in the next year or so, as the GOE has prepared the remaining three gins for privatization and anticipates selling them in the second half of 1999.	Improving	Improving	Strong	Positive
5.c) Private sector share of cotton spinning (volume)	The share of yarn spun by the private sector increased steadily in the 1990s to over 30 percent. The GOE has privatized 3 affiliated spinning companies since 1997/98 and leased out one major unit of another. The private sector invested in more than a dozen new medium-scale operations, and the smaller traditional spinners also continued to increase in number and size. The complex set of policies affecting the decision to invest in spinning seems to be more conducive at the end of the 1990s than at the beginning.	Improving	Improving	Weak	Positive
6. Private sector share of volume of wheat milling	Commercial private mills are not allowed to purchase domestic wheat. Investment in wheat milling, however, is open, and has expanded rapidly with imported wheat as input. The private share of wheat milling reached almost 20 percent in 1997. This expansion continues. A significant potential problem exists for these new modern mills, however, if there is no privatization of the older public mills: the latter have unfair cost advantages.	Improving	Improving	Weak	Positive

PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING PRE-APRP PERIOD (1990-97), cont'd

Indicator	Effects of Policy Reforms	Indicator Trend, Overall	Indicator Trend, Ending	Strength of Policy Effect	Nature of Policy Effect
7.a) Private sector share of employment, cotton ginning	Since the GOE decided to privatize the cotton ginning industry, it has moved relatively quickly. This indicator parallels the share in cotton ginned, showing the dramatic rise of the private sector's share in this industry. The private share of employment in ginning reached more than 45 percent in 1998/99.	Improving	Improving	Strong	Positive
7.b) Private sector share of employment, cotton spinning	This indicator parallels the share in cotton spun; the measured private sector share of employment reached 11%.	Improving	Improving	Weak	Positive
8.Irrigated areas under private water user associations (WUAs)	WUAs started on a limited basis under IIP. They may now be moving into a more rapid expansion under APRP.	Improving	Improving	Weak, Improving	Positive
9. Agricultural production per unit of water	This indicator measures the overall impact of a wide range of policies on agricultural production and on water availability and conservation. The indicator does not include tree crops or any production on the New Lands, which creates a bias in the indicator, probably downward. In 1997 the indicator was 5-9 percent higher than in 1990.	Volatile and Improving	Improving	Weak	Positive
10. Volume of paddy rice production per unit of water	The GOE attempted to control rice acreage to conserve water with great difficulty. The indicator reveals some efficiency gains in the use of water to produce rice (from .65 million tons per bcm to .75) even before the recent effort to capture the water-saving benefits of short-season rice varieties through coordinated planting and a shortened irrigation season.	Improving	Improving	Weak	Controversial
11. Ratio of earnings of non-banking activities to total earnings, PBDAC	The ratio of non-banking revenue to total PBDAC revenue declined from about 30 percent during 1990-92 to about 12.5 percent during 1995-97. A number of benchmarks under APRP strove to increase the share of the private sector and reduce the share of PBDAC in fertilizer distribution, as well as to increase PBDAC's focus on banking. Now that PBDAC is no longer receiving significant quantities of fertilizer from the domestic factories, it appears that "pesticides" (mostly for cotton) is the major non-banking source of revenue.	Improving	No Change	?	Positive

PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING PRE-APRP PERIOD (1990-97), cont'd

Indicator	Effects of Policy Reforms	Indicator Trend, Overall	Indicator Trend, Ending	Strength of Policy Effect	Nature of Policy Effect
12. Agricultural resource income (real)	The nominal ARI increased for the ten major crops on a per feddan basis and in the aggregate, but none showed an increase in real ARI per feddan. Only rice experienced an increase in real aggregate ARI, because of its dramatic increase in cropped area. The aggregate real ARI for all crops studied declined during the period, from an index value of 100 in 1990 to 74 in 1997, although it increased from 1994 to 1996. The level of the indicator is the result of the effects of policies on output quantity and prices and on the quantity of inputs purchased from outside the agricultural sector and their prices. The indicator does not include tree crops or any production on the New Lands, which creates a bias in the indicator, probably downward.	Worsening	No Change	?	Complex

1. NOMINAL PROTECTION COEFFICIENT

Definition of Progress Indicator

The nominal protection coefficient (NPC) of a commodity is the ratio of its domestic price to the “world” price, where the world price is taken as the opportunity cost for the product. In practice the world price is the price of the “standard” commodity from a regular supplier to the international market. Examples are hard red wheat/fob US Gulf and Thai rice, 5% broken/fob Bangkok.

NPCs can be calculated on an import or export parity basis, depending on the situation in the country in question. If the country is normally an importer, then the import parity is normally examined. Note that because transportation costs provide a natural “wedge” between world and domestic prices, in the absence of interventions distorting domestic prices, domestic prices normally are somewhere between the import and export parity prices that are calculated from the world price at the same location.

In either case (import or export parity), the NPC is calculated at a particular location with a particular purchaser of the commodity in mind. This location could be inside or outside the country in question. The location is chosen as the one at which the purchaser would face the choice of purchasing either the standard commodity or the country in question’s commodity, which are assumed to be sufficiently similar in nature and quality to make the comparison meaningful. If the quality of the two products is not comparable, then adjustments to the standard price may be needed.³

For import parity, the world (CIF) price for the commodity is adjusted upward for internal transportation and marketing margins. These adjustments make the world price comparable to the estimated domestic price, e.g., one that the farmer receives. The CIF price can also be adjusted to a major consumption point within a country to assess incentives to consume imported vs. domestic rice. Import tariffs are not included in the calculation of the NPC, but they should be discussed in the accompanying analysis. That is, the international price is the one that should prevail without any interventions (like tariffs), and the domestic price is the actually observed price (with interventions). The comparison shows the impact of all interventions, whether compounding or offsetting.

For export parity, the domestic price can be adjusted upward for international transportation and handling costs required for it to reach a location at which competing countries’ product is available, where they can be compared. In some cases, the world price of the commodity is adjusted downward, on the theory that after the product leaves the farmer, there are costs of domestic marketing to deliver the good to the port.⁴

Alternatively put, the NPC is a ratio of the domestic price market actors face given intervention and the price they would have faced in the absence of intervention. The numerical value indicates the positive, negative or neutral structure of protection generated by policy. That is, if the NPC is greater than one,

³This is not a preferred method, however, since the adjustment may lead to bias in the statistic. This is less of a problem when a trend is examined and the absolute value of the indicator is not too important.

⁴ This paragraph paraphrases material found in Isabelle Tsakok’s *Agricultural Price Policy: A Practitioner’s Guide to Partial Equilibrium Analysis*, 1990.

the domestic price is higher than the world price and buyers are being “taxed” by policies or other factors that caused the difference between the two prices. Similarly, if the NPC is less than one, the domestic price is less than the world price, and buyers of the commodity are being “subsidized.” In each case of course the reverse would be true for sellers of the commodity: when the NPC is greater than one, producers are subsidized.

1a. Nominal Protection Coefficient, Urea

Relationship of Progress Indicator to Reforms under APRP

Policy reforms under APCP and APRP have focused on several aspects of the fertilizer market in Egypt. These are mainly the distribution of fertilizer by private agents rather than PBDAC or other public entities, the removal of subsidies on fertilizer sold domestically, and the lowering of import duties on fertilizer. The first is covered by another progress indicator. The other two are each related to the price of fertilizer in Egypt and its relation to the world price of fertilizer. The duty also affects the supply of fertilizer. During the “crisis” in 1995 and 1996, the import duty was lifted temporarily so that domestic supplies could be augmented through imports.

This progress indicator reveals whether there is a significant gap between the domestic and world price of fertilizer. This gap could be due to rigid domestic pricing by the producing factories, which are owned by public sector entities; to import duties; to a domestic subsidy (depending on how it was applied); to lower costs of production in Egypt; or to a natural transportation cost barrier between the two markets. The NPC does not reveal which of these is the cause of the gap; this information is supplied in the accompanying analysis.

Sources of Information

Abu Qir company
El Nasr (Talkha) company
Green Markets (industry publication)
Fertilizer distributors in Egypt

Calculation of Progress Indicator

Urea is a very commonly used fertilizer in Egypt. It is chosen as representative of the fertilizer commodity.

Both import and export calculations are made, as Egypt is in the position of being able to export, due to low costs of production, but has also found it necessary to import in the past.

Results and Analysis

The results are shown in Tables 1a-1, B1a-1 and B1a-2. The indicators show that the price of fertilizer in Egypt has generally been below the world price in the 1990s. This is largely due to low costs of production in some of the producing factories (Abu Qir) and to relatively higher world prices. In this case the 30-percent tariff was not necessary to protect the factories. The tariff will hurt farmers, however, if world prices fall below domestic prices and the tariff keeps the cost to farmers higher than the world price.

Virtually fixed ex-factory (domestic) prices mean that changes in the NPC largely reflect changes in the world price. Removal of subsidies to fertilizer users in the early 1990s was part of the necessary price policy reforms that could lead to closer conformity of domestic and international prices. The GOE plans to privatize the major fertilizer producer Abu Qir; this is another step that might lead to more flexible ex-factory pricing.

As reported in Zalla et al. (1999), fertilizer prices in Egypt are now above the low world prices. This is a major shift from the trend shown in these progress indicators. In this situation, the remaining tariff on imports protects inefficient producers of fertilizer and raises the price of fertilizer to farmers. For this reason APRP has recommended lowering of this tariff.

While additional production capacity now coming on line makes it unlikely that Egypt will need to import in the near future, current low world prices also make it important for Egypt to reconsider the current level of pricing by the producing factories.

Table 1a-1: Nominal Protection Coefficient for Urea, 1990 to 1997

Basis	1991	1992	1993	1994	1995	1996	1997
Import Parity	0.56	0.96	1.37	1.19	0.65	0.74	1.14
Export Parity	0.52	0.90	1.23	0.90	0.65	0.70	1.01

1b. Nominal Protection Coefficient, Rice

Relationship of Progress Indicator to Reforms under APRP

Egypt imposes a 20-percent tariff on imported rice, plus 5% sales tax and 3% miscellaneous import fees; the total burden on a potential importer is thus 30 percent (tariffs and taxes are multiplicative). APRP attempted to reduce this tariff to 10 percent or less in Tranche III. Imports are negligible at present and limited to high-quality, expensive *basmati* and Uncle Ben's rice. If rice tariffs are eliminated in Egypt, imports of these specialty rices will likely expand little. It is unclear which types of rice would be imported for wider consumption (below the highest income niche and foreign consumers willing to pay for expensive specialty rices) in the absence of protection.

Sources of Information

CAPMAS

University of Arkansas (1995)

USDA/ERS

Australian Bureau of Agricultural Economics Research (ABARE)

Calculation of Progress Indicator

Imports could be either a) inexpensive Thai or Vietnamese long grain broken rice or b) more expensive U.S. or Australian medium grain *japonica* rice. MVE considers alternative a) more likely. Hence, the

more appropriate time-series used in calculating border prices for calculating NPCs is the readily available price series for Thai rice (15%, 35% or 100% broken long grain). For comparative purposes, both Thai and U.S. prices are used.

Results and Analysis

Import parity. Table 1b-1 shows that the NPCs are less than 1.0 when the import competing rice used in the comparison is U.S. medium grain rice. The NPCs are higher when Thai 15% broken rice is used in the comparison. Finally, the NPCs are substantially greater than 1.0 when the import competing rice is Thai 100% broken, the cheapest long grain rice exported from Thailand, the number one exporter in the world.

Egyptian analysts and experts think that 100% Thai broken rice will never be imported into Egypt, because of its low quality. Moreover, for the average Egyptian consumer, the US rice used in the comparison may be higher quality and price than would be desired. Comparing Egypt's medium grain *japonica* rice to Thai 15% broken rice reveals that at the beginning of 1990s the tariff did not seem to be distorting the domestic price. By 1996 and 1997, however, the domestic price had risen more than 10 percent above the import price of Thai 15% broken rice. The NPC for these years may be revealing the impact of the tariff on potential importers and potentially imported rice. If this is the case, then lowering the tariff should put some downward pressure on domestic rice prices.

Table 1b-1: Nominal Protection Coefficients (Import Parity) for Egyptian Rice

Import Competing Rice	1990	1991	1992	1993	1994	1995	1996	1997
U.S. medium grain	0.87	0.76	0.84	0.51	0.79	0.75	0.85	0.85
Thai 15% broken	1.04	0.96	1.09	0.98	1.06	0.98	1.13	1.18
Thai 100% broken	1.51	1.27	1.37	1.38	1.20	1.20	1.51	1.55

Sources: See Table 1b-2.

Note: Point of comparison is the wholesale level.

Note that generally higher world rice prices in 1998 relative to 1997, contributed to a lowering of all the NPCs in 1998 from their 1997 highs. Exceptionally low early (peak) season paddy prices in Egyptian rice producing governorates, which have rose steadily from December 1998 to May 1999, also kept the numerator (in the NPC calculation) low in 1998 relative to the earlier years and contributed to low early season 1998 NPCs.

Export parity. As an important rice exporter to Mediterranean and selected Middle Eastern markets, Egypt shipped 408,000 mt in 1997/98 and 355,000 mt in 1995/96. MVE has information on export prices from various sources, though the prices tend to be calendar year rather than marketing year prices (hence they cover parts of two marketing years). U.S. medium grain rice prices are available

and can be adjusted to compare with Egyptian export prices in a Middle Eastern market where the two rices compete, such as Turkey or Syria. Similarly, Australian medium grain rice prices can be adjusted and compared with Egyptian rice prices in the Gulf markets, such as Saudi Arabia. For the purposes of this analysis, MVE focuses on comparing the competitiveness of Egyptian rice with American rice in Turkey, a large market for both countries, and with Australian rice in Saudi Arabia. NPCs are calculated and shown in Table 1b-2.

Table 1b-2: Export Parity Comparisons for Egyptian and Other Traded Rice

Export Competing Rice	Point of Comparison	1990	1991	1992	1993	1994	1995	1996	1997	1998
U.S. Medium Grain	Turkey, CIF	0.70	0.76	0.75	0.74	1.15	0.82	0.98	0.89	0.73
Australian Medium Grain	Saudi Arabia, CIF	NA	0.89	0.72	1.00	1.06	0.99	1.02	0.76	0.87

Sources: CAPMAS, University of Arkansas (1995), USDA/ERS, ABARE

Since the export parity coefficients are less than 1.0, Egyptian rice has been cheaper than American rice in the Turkish market for all the years during the 1990s except one (1994). The unweighted average NPC for the entire nine-year period (1990-1998) is 0.84. Egyptian rice has also been cheaper in the Saudi market than Australian rice during most years, but the gap is narrower (NPC averages 0.91 for the 1991-1998 period), and hence Egypt's competitive advantage there is more tenuous. For four years, the NPC has equaled 1.0 or more (for one of these four years, it is actually 0.99).

There are no taxes on Egyptian rice exports. No import duties are assumed in the analysis for Turkey or Saudi Arabia, though they are presumably negligible and would tend to cancel each other out in the NPC calculations (augmenting both numerator and denominator).

Implications. One of the lessons of the fertilizer "crisis" was that opening an export market without also opening the import market may lead to trouble, in the form of shortage of domestic supply, accompanied by high domestic prices. There is some evidence that this same effect is being felt in the Egyptian rice market, because of the import duty and taxes. While these historical data do not provide the basis to complete an analysis of this problem⁵, the export parity data do confirm that Egypt can export rice competitively. In such cases it is important to open the import market, so that importers and consumers can together obtain the quality of rice that they prefer at a price that they can afford. Other policy issues that may hinder imports (raised in previous MVE reports) include the possible imposition of minimum quality standards on rice imports. Other than for health purposes, there is no reason to impose such standards. The consumer will impose his/her own standard by purchasing or not purchasing the commodity at the offered price.

⁵The MVE Unit plans to issue annual reports on these progress indicators, however.

2. CORRELATION COEFFICIENT BETWEEN THE MONTHLY PRICES OF US PIMA AND EGYPTIAN COTTONS

Definition of Progress Indicator

It is possible to calculate a nominal protection coefficient for cotton. This calculation depends on the small country assumption, namely that Egypt does not affect the price of cotton, but is a price taker. If this were true, the international price would be an independent measure of opportunity cost. In the LS and ELS cotton markets, however, Egypt's cotton has a major share; the pricing behavior of Egypt affects the price of Pima and vice versa. Thus using any version of the Pima price to measure the opportunity cost of Egyptian cotton is not valid, as the Pima price is dependent on the price of Egyptian cotton, not independent of it.

A better indicator is the correlation coefficient between the weekly prices of US Pima and Egyptian cotton. This will reflect whether the Government is allowing the price to fluctuate freely like a market price, or whether they are fixing the price and ignoring the price of Pima. In the first case, because the two cottons are close substitutes, the correlation will be high; in the second case, the correlation will be low.

Relationship of Progress Indicator to Reforms under APRP

Cotton is a key commodity both in the agricultural economy of Egypt and in APRP. Efforts under way since APCP have had as one main focus the liberalization of the cotton market in Egypt. They started with liberalizing production choices and quickly moved into liberalizing export pricing. Several benchmarks have attempted to weaken or remove interventions that separate the domestic from the world market, in particular the minimum export prices that were set by ALCOTEXA. Delays in privatization of the public sector textile industry have complicated the task of liberalization, as the public companies need to ensure that their pricing is consistent with their costs of production.

Sources of Information

ALCOTEXA Information Center.

Cotton World Statistics, Bulletin of International Cotton Advisory Committee (ICAC), CotLook Limited

Calculation of Progress Indicator

In order to calculate the correlation coefficient between the prices of US Pima (Grade 3) and Egyptian cotton (grade good/fully good), two extra-long-staple varieties SGiza 70 and Giza 77S were selected. Moreover, two long-staple varieties SGiza 75 and Giza 86S were selected as close substitutes to US Pima (exports of Giza 86 started during the season 1996/97).

It was difficult to find data on weekly prices, and monthly price data for the seasons 1992/93 and 1993/94 were not available. In addition there were periods when exports of most Egyptian cottons

were not permitted.⁶ Therefore, monthly prices were used for the rest of the 1990-97 period. Weekly prices for 1996/97 were also studied (Tables B2-1, B2-2, and 2-1).

The Egyptian cotton prices used are based in all cases on the minimum export prices set by the Government or by ALCOTEXA. They are these prices, adjusted for transportation costs to Europe. Time series of actual sale prices of Egyptian cottons are not available. US Pima prices, which are actual market prices, are also observed in Europe, thus allowing direct comparison either in the correlation coefficient or in a graph.

The use of the good/fully good grade introduces some bias into the analysis. The price of this grade tends to be more stable than other grades in some recent years. That is, when market pressures accumulate, the tendency of the GOE has been to reduce the minimum exportable grade and to increase the differentials between grades⁷, but leave the “benchmark” price of the good/fully grade unchanged.

Results and Analysis

Correlation between monthly prices of US Pima and Egyptian cottons, 1990-1997. The results show that there has rarely been a positive correlation between the prices of the Egyptian cottons chosen and US Pima (Table B2-3, Figure 2-1). As recently as 1997/98, Egypt maintained constant minimum export prices throughout the marketing season.

Figure 2-1 shows that Egyptian prices often tended to stay the same during all or most of a given season, while Pima prices tended to fluctuate more. This reflects the behavior of those setting the opening prices for Egyptian cotton in September of each year and then sometimes adjusting them during the season. In the past, part of the philosophy of pricing seems to have been that early buyers should not be let down by subsequent decreases in price; that is, an early buyer would be ensured that s/he did not miss an opportunity to buy at a better price. Of course this strategy led to price changes by Pima sellers that took advantage of the weakness of this strategy, namely the periods of fixed prices when Pima was free to compete by offering a lower price.

In general one can say that the price of Giza 75 for the period through 1997/98 became closer to that of Pima. The correlations for individual years do not show this trend very much, however. The negative correlation in 1990/91 reflects a narrowing of the price gap. In 1993/94, however, the negative correlation is due to the Pima price accelerating away from the price of Giza 75. The gap in the middle of the series reflects the prohibition on exports, which goes beyond fixing prices as a means of reducing market share in a competitive market. The positive correlation in 1996/97 indicates that the price of Giza 75 and that of Pima took similarly shaped paths over the year. This would be seen

⁶In late October 1995, the GOE announced that cotton exports would not be permitted until the needs of domestic mills had been met. This meant that cotton exports were not likely to occur until all cotton crop had been delivered to the gins, which was estimated to be in February 1996. In early February, 1996, a GOE decision to permit exports of four ELS cotton varieties was announced, while no exports of LS cotton varieties were permitted. Export prices for these varieties were announced in February, 1996, by MTS. The export prices, which were approved by members of ALCOTEXA, were valid for one week (12 - 17 February).

⁷The effect of these actions is to increase the exports of lower-grade cottons.

as an unqualified advance in pricing policy had it not been followed by a year in which the price of Giza 75 remained fixed (price correlation = zero) for the entire season.

From Figure 2-1 one can see that for the period shown there was some progress in narrowing the price gap and in maintaining flexibility in the price of Giza 75 up to 1996/97. The following year the flexibility was lost again to fixed prices. This inflexibility in pricing contributed to the build-up of inventory of Giza 75 and eventually to its demise as a cotton variety in Egypt, despite apparent high demand by spinners.

Correlation between weekly prices of US Pima and Egyptian cottons, 1996-1997. During this marketing season, the price of Giza 75 increased by 7%, and its price was fixed for many weeks at a time. The only changes in price were upwards. The price of US Pima changed by 12% over the season and fluctuated in both directions. Thus the very high correlation between the two is surprising (Table 2-2 and Figure 2-2). In contrast to this high correlation for the entire season, one can examine the correlation during the early part of the season, during which time in fact virtually all of the sales of Egyptian lint took place. The correlation between the Pima price and price of Giza 75 was zero from the beginning of the season through beginning of December (the price of Giza 75 did not change).

The correlation between the prices of US Pima and Giza 86 was lower than that with Giza 75, namely 0.71 for the entire season. Again, however, for major parts of the season, the correlation was zero, as the price of Giza 86 also remained fixed for many weeks at a time.

Implications. The contrast between the two Giza 75 weekly price correlations—one almost one and the other zero—shows that the correlation coefficient is not an ideal statistic for analyzing the similarity of two price series. This statistic must be combined with careful examination of the raw data, which is often best done visually.

Together, the data and the analyses show that through 1997/98 there was still significant rigidity in the export pricing of Egyptian cottons.

**Table 2-1: Correlations between Monthly Prices of US Pima and Egyptian Cottons,
1989/90 - 1997/98**

Season	Giza 70	Giza 77	Giza 75	Giza 86
Sep. 89 - Aug. 90*	-0.47	0.64	0.63	---
Sep. 90 - Jul. 91	-0.89	-0.89	-0.89	---
Sep. 93 - Aug. 94	-0.46	No Exports	-0.68	---
Jan. 95 - Aug. 95	No Exports	No Exports	No Exports	---
Sep. 95 - Jan. 96	No Exports	No Exports	No Exports	---
Feb. 96 - Aug. 96	0**	0**	No Exports	---
Sep. 96 - Aug. 97	0.66	0.66	0.66	0.6
Sep. 97 - Jul. 98	0**	0**	0**	0.53

Sources: Tables B2-1 and B2-2.

*11 observations, US Pima price for July, 1990 not available.

**There was no change during the entire season in the price of the Egyptian variety.

**Table 2-2: Correlations between Weekly Prices of US Pima and Egyptian Cotton
Varieties, 1996/97**

	Giza 70	Giza 77	Giza 75	Giza 86	US Pima
Giza 70	1				
Giza 77	0.98	1			
Giza 75	0.99	0.98	1		
Giza 86	0.79	0.86	0.78	1	
US Pima	0.96	0.96	0.95	0.71	1

Source: Table B2-3.

Figure 2-1: Monthly Prices for US Pima and Egyptian Cotton Varieties, 1989/90-1997/98

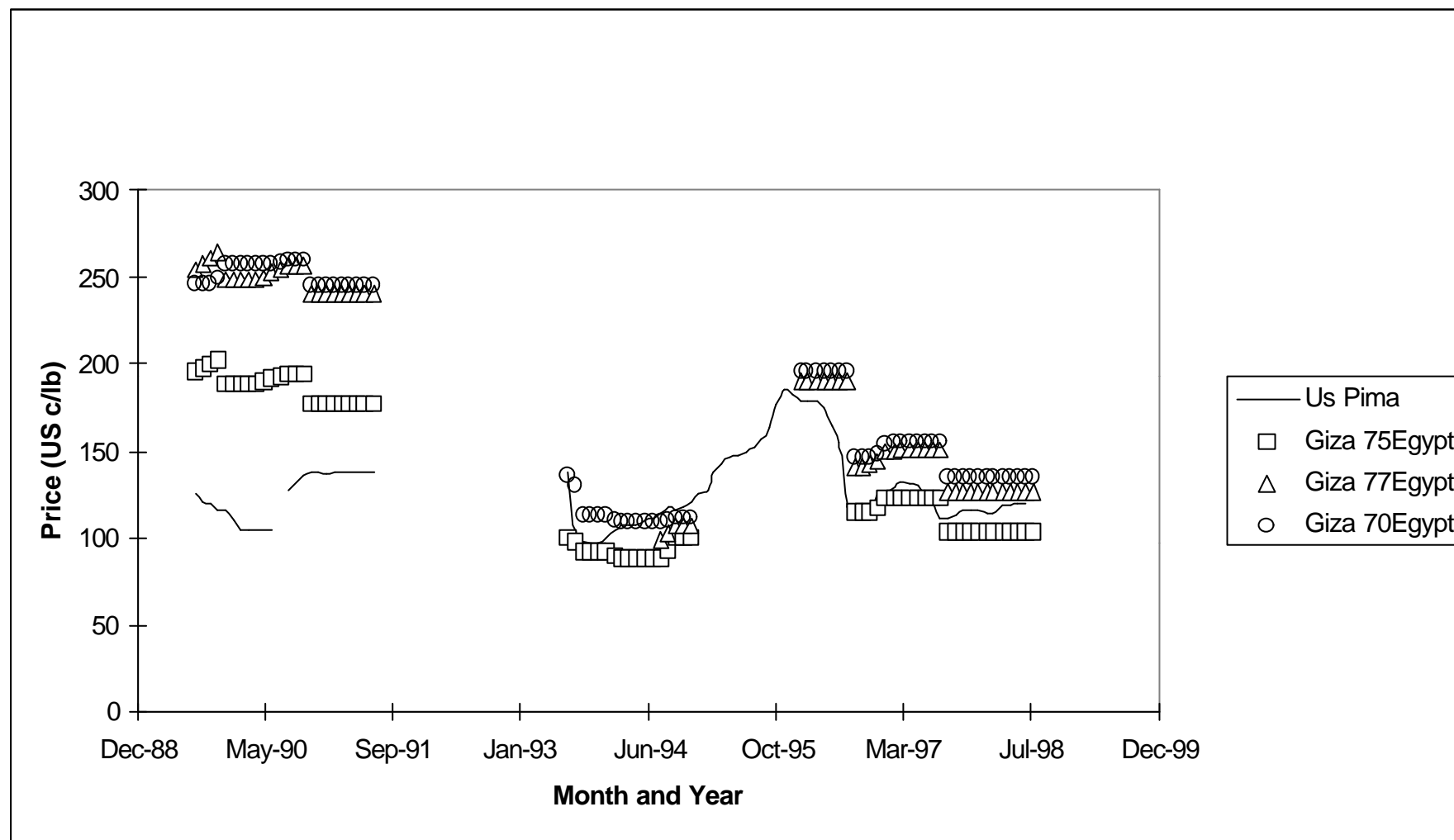
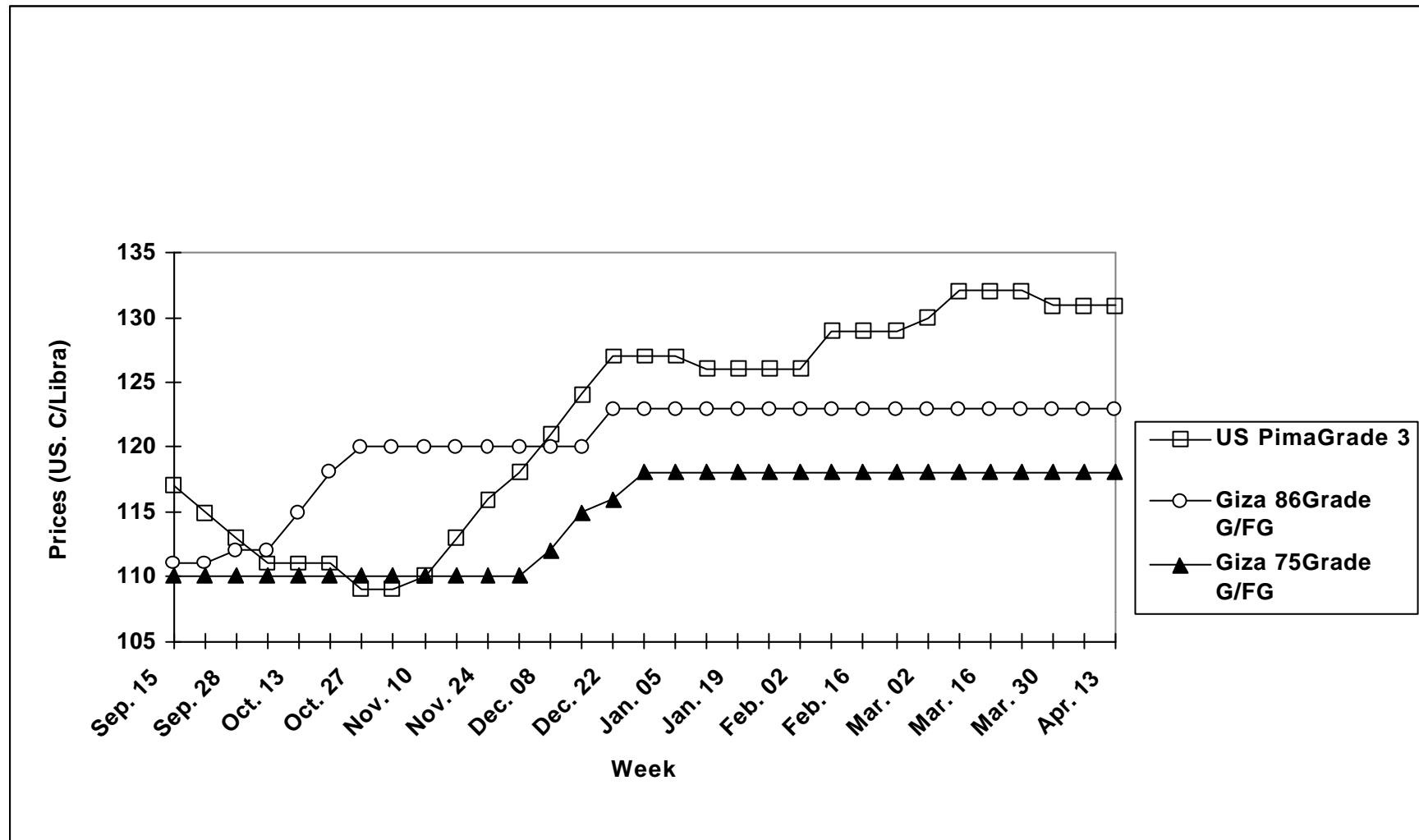


Figure 2-2: Egyptian Export Prices of Egyptian Cotton and US Pima by Variety and Week during the 1996-1997 Season



3. REAL VALUE OF EXPORTS OF COTTON LINT AND COTTON TEXTILE PRODUCTS

Definition of Progress Indicators

These indicators are defined simply as the level of exports, in value. The total value of exports is deflated to ensure that the indicator is reflecting real increases in exports, not simply an increasing trend in the prices of all goods. The wholesale price index is used for deflating, and the result is then expressed in constant LE of 1986/87. That is, the volume of exports would show whether the amount of exports was increasing or not, but the volumes of different products like yarn and RMGs cannot be added together because of their differing values. Indeed, even different varieties of lint have significantly different values per unit. Value is the only meaningful way to add the different products' exports together, but the value must be deflated as mentioned.

Relationship of Progress Indicators to Reforms under APRP

The textile industry is one of the largest industries in Egypt. Exports of cotton as lint, yarn, and textiles are among the main sources of foreign exchange. For these reasons, under APRP considerable effort has been devoted to rationalizing the cotton textile industry. These efforts have taken the form of privatization of producing companies, liberalization of the domestic market and its price and phytosanitary trade barriers, and attempts to allow the production of American or upland cotton in Egypt. The MVE Unit recently discovered a significant number of new private spinners, who presumably have invested because of the more conducive policy environment. These spinners are attempting to make use of unfilled quotas for, among other things, cotton yarn.

3a. Real Value of Cotton Lint Exports

Sources of Information

CAPMAS

Calculation of Progress Indicator

See definition.

Results and Analysis

The nominal value of cotton lint exports was very volatile over the period 1987-97 (Table 3a-1, Figure 3-1). The trend is slightly upward, with a growth rate of 1.4 percent per year. After deflation the the real value of lint exports declines at the rate of 9.4 percent per year.

Policy can have a major impact on lint exports, either by setting minimum export prices that are too high, by setting minium export grades that are too high, or by banning exports, all of which have occurred during this period. In addition exogenous events in the world market affect lint exports. Some highlights of the 1990s include:

C In the early 1990s, production was at an all-time low, which reduced exports.

- C In 1994, the dramatic increase in the value of exports was mostly due to Egypt's implementation of a major liberalization of its cotton export policy, including an effective floor price. The jump in exports was also partly due to declines in production in some major producing countries (India, Pakistan, and China).

Table 3a-1: Cotton Lint Exports, 1987-1997

Year	Nominal Value (LE Millions)	Wholesale Price Index (1986/87=100)	Value in Constant LE of 1986/87 (Millions)
1987	272.1	107.1	254.0
1988	318.7	146.0	218.0
1989	594.2	192.4	309.0
1990	562.2	214.6	262.0
1991	193.4	257.4	75.0
1992	175.2	273.7	64.0
1993	146.7	291.8	50.0
1994	791.1	319.0	248.0
1995	517.3	339.0	153.0
1996	311.9	363.7	86.0
1997	374.7	366.7	102.0

Source: Central Agency for Public Mobilization and Statistics, Statistical Yearbook, different issues.

3b. Real Value of Cotton Yarn Exports

Sources of Information

Textile Consolidation Fund

Calculation of Progress Indicator

See definition.

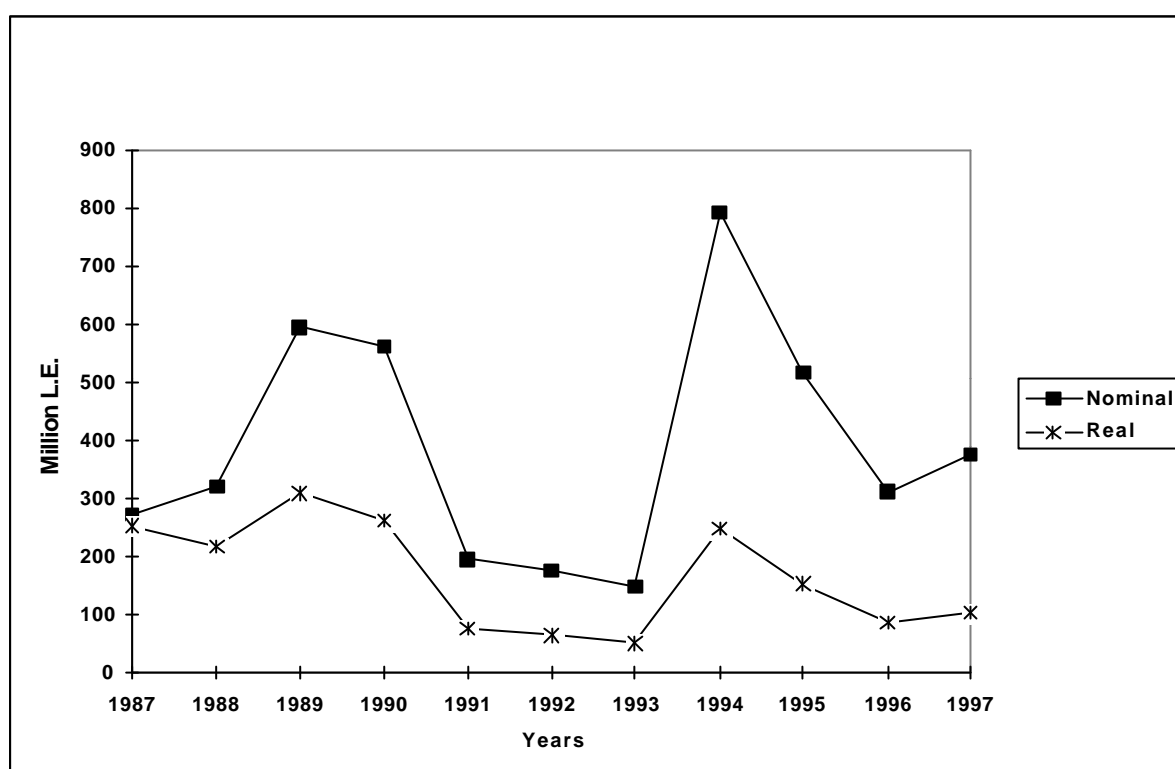
Results and Analysis

Exports of cotton yarn account for about 50% of the nominal value of total cotton product exports in Egypt. Pure cotton yarn accounted for 88% of pure and mixed cotton yarn exports during the period 1992-1997. Table 3b-1 shows the nominal and constant currency value of cotton yarn exports during the period 1990-1997.

Yarn exports were also rather volatile in the 1990s. Lint and yarn exports tended to increase or decrease in tandem, reflecting changes in the level of seed cotton production. The overall growth rate of the nominal value of pure cotton yarn exports was 1.3 percent per year; for cotton and mixed cotton yarns it was 0.7 percent per year. The real value of yarn exports declined over the 1990-97 period.

For pure cotton yarn the rate was -4.5 percent per year; for cotton and mixed cotton yarn it was -7.8 percent. In addition to minimum export prices for yarn, exogenous events for the yarn market included:

Figure 3-1: Export Value of Cotton Lint, 1987-1997



- C The value of cotton yarn exported in 1996 dropped sharply due to the sharp increase in the prices of raw cotton during the 1995/96 season and the concomitant increase in the prices of cotton yarn.
- C The decline in the value of German mark during the first few months of 1997 played a major role in negatively influencing the value of cotton yarn exports. To mitigate this effect, the commercial committee of TCF decided to denominate all cotton transactions in US dollars.

3c. Real Value of RMG Exports

Sources of Information

Textile Consolidation Fund

Calculation of Progress Indicator

See definition.

Results and Analysis

The international RMG industry is extremely competitive. It is characterized by continuous and fast change in fashion and consumer preference, requiring a quick response by suppliers. Being of high value added, exports of ready-made cotton garments play an important role in Egypt's exports of

cotton products. In 1997, exports of RMGs were worth LE 138 million. In 1997/98 the US market absorbed the majority of Egypt's ready-made garment exports (about 84%).

Table 3b-1: Exports of Cotton Yarn, 1990-1997

Year	Quantity (Tons)	Nominal Value (LE 000s)	Value in Constant LE of 1986/87 (000s)
Cotton yarn (100% cotton)			
1990	NA	NA	NA
1991	NA	NA	NA
1992	59906	813866	297357
1993	57984	683816	234344
1994	93332	1131105	354578
1995	63224	1007442	297181
1996	41194	656184	188419
1997	62641	936485	255382
Cotton yarn (100% cotton)+Blended yarn			
1990	71665	917720	472642
1991	72025	906670	352242
1992	69105	912461	333380
1993	65917	755117	258779
1994	110739	1303978	408771
1995	71027	1107436	326677
1996	47665	726821	199841
1997	68110	991514	270388

Source: Textile Consolidation Fund

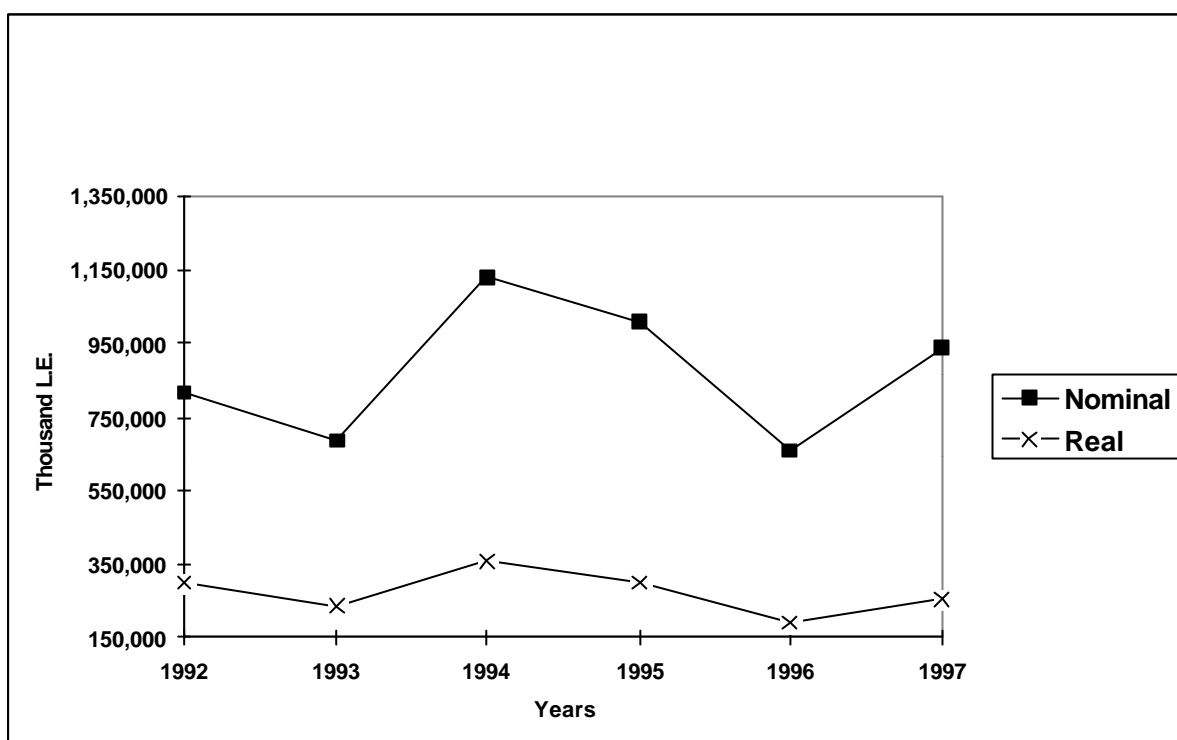
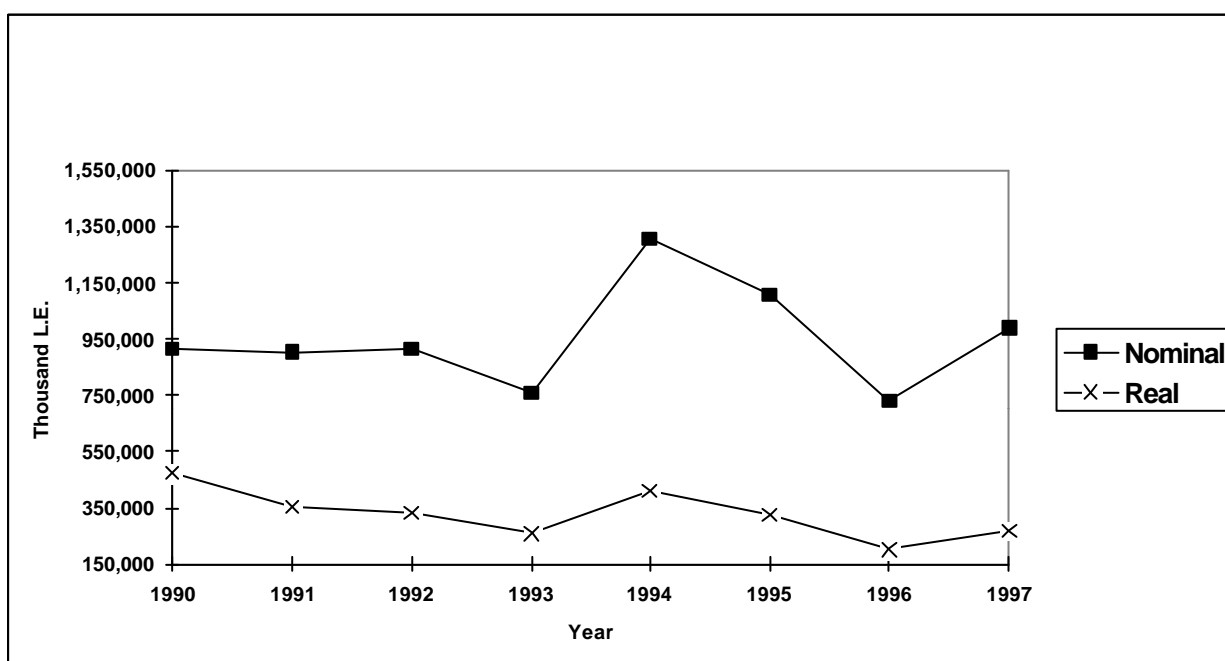


Figure 3-2: Export Value for Cotton Yarn (100% Cotton), 1992-1997

**Figure 3-3: Export Value of Cotton Yarn,
(100% Cotton +Blended Yarn), 1990-1997**



Nominal value of RMG exports. Both the quantity and value of RMG exports followed an increasing trend over the period 1990-1997, as shown in Table 3c-1. The growth rate in nominal value of pure cotton RMGs was 15.7 percent per year; in cotton and mixed RMGs it was 25.4 percent. The trend was steadily upward. Apparently this industry is not seriously hampered by policy or other constraints. The private sector apparently plays a much larger role in this sector than in upstream parts of the textile industry.

Real value of RMG exports. The real value of exports of ready-made garments also followed an increasing trend during the period 1990-1997. The growth rate in pure cotton RMGS was 8.7 percent per year; in cotton and mixed RMGs it was 16.4 percent.

Exports of knitted products also increased at substantial rates during the 1990s (Table 3c-2).

Table 3c-1: Exports of RMGs, 1990-1997

Year	Quantity (Tons)	Nominal Value (LE 000s)	Value in Constant LE of 1986/87 (000s)
100% cotton			
1990	NA	NA	NA
1991	NA	NA	NA
1992	6,162	234,193	85,566
1993	9,413	341,285	116,959
1994	10,268	396,413	124,267
1995	12,900	492,347	145,235
1996	13,446	522,804	143,746
1997	11,831	483,282	131,792
100% cotton + mixed cotton			
1990	3,723	105,287	49,062
1991	4,006	174,503	67,794
1992	6,240	235,498	86,042
1993	9,455	342,233	117,283
1994	10,275	396,856	124,406
1995	12,940	493,952	145,709
1996	13,857	537,241	147,715
1997	12,333	506,041	137,999

Source: Textile Consolidation Fund

Table 3c-2: Exports of Knitted Fabrics, 1990-1997

Year	Quantity (Tons)	Nominal value (LE 000s)	Value in Constant LE of 1986/87 (000s)
1990	5,851	175,425	81,745
1991	6,720	244,364	94,936
1992	6,776	255,954	93,515
1993	10,007	367,383	125,902
1994	12,325	433,133	135,778
1995	14,423	527,022	155,464
1996	17,100	645,154	177,386
1997	18,861	772,990	210,796

Source: Textile Consolidation Fund

Figure 3-4: Export Value of RMGs (100% Cotton), 1992-1997

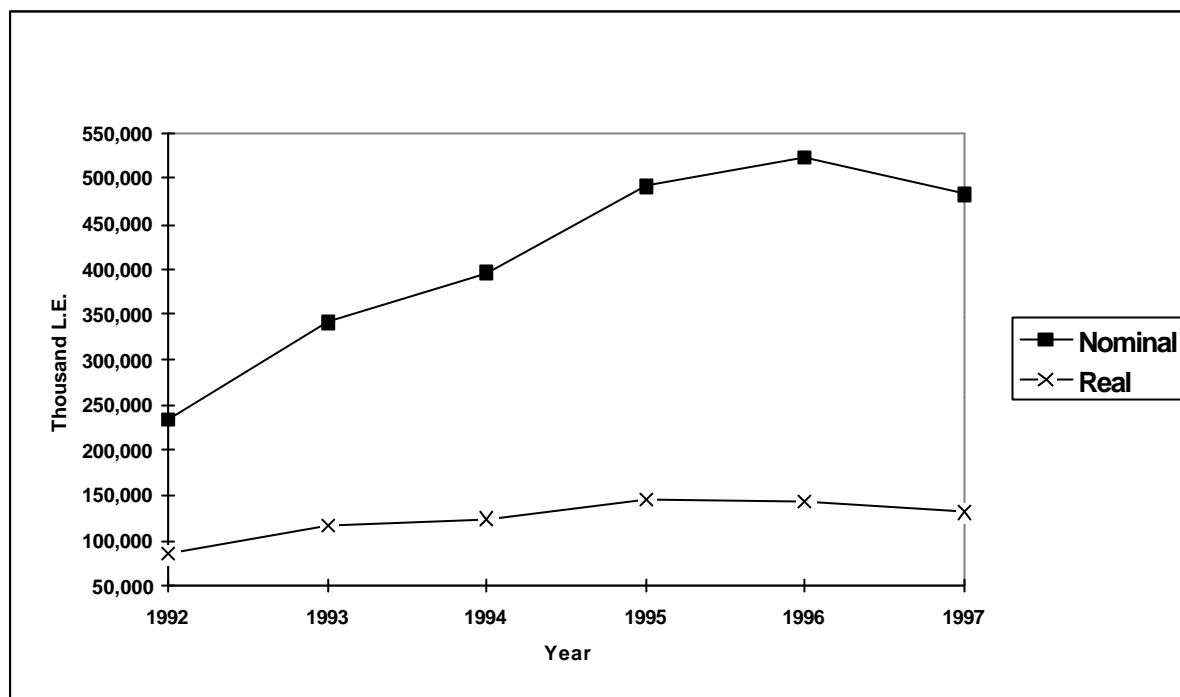
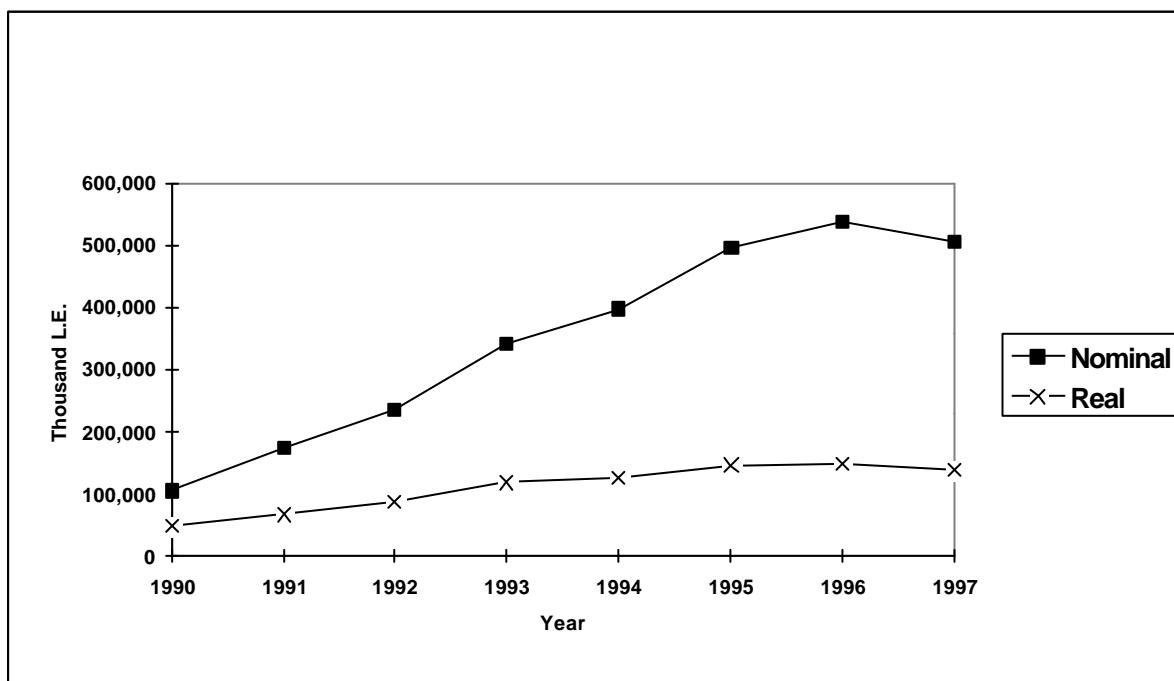


Figure 3-5 Export Values of RMGs (100% Cotton + Mixed Cotton), 1990-1997



4. PRIVATE SECTOR SHARE OF DISTRIBUTION OF NITROGENOUS FERTILIZER

Definition of Progress Indicator

This indicator is defined as the share of the domestically produced nitrogenous fertilizer that is sold by the producing factories to private entities.

Relationship of Progress Indicator to Reforms under APRP

Under APCP and under tranches I and II of APRP, there were significant efforts to ensure that the wholesale and retail trade of fertilizer be open to participation by the private sector. This indicator measures whether that is the case.

Beginning in 1989 direct production subsidies on fertilizer were eliminated. In July, 1991, subsidies to PBDAC on distribution were eliminated⁸ and fertilizer distribution by the private sector was legalized.⁹ During the fertilizer “crisis” of 1995 and 1996, however, distribution of domestically produced fertilizer was removed from private control and returned to PBDAC. Since that time, PBDAC’s share has again declined.

Sources of Information

Abu Qir company

El Nasr company

PBDAC

MPE, Fertilizer Bureau

Calculation of Progress Indicator

See definition.

Results and Analysis

The removal of subsidies in the late 1980s and early 1990s allowed the private sector to become active in chemical fertilizer distribution in Egypt. Private traders both re-sell fertilizers to retailers located at the regional or village levels and sell directly to relatively big farmers.

By July, 1992⁵ only one year after legalization⁶ private sector traders dominated the market. By December, 1992 there were over 6,000 private fertilizer dealers in Egypt; they handled about 60 percent of fertilizer distribution (IFDC, 1993, cited in Zalla and Saad, 1999, p. 9).

By 1995 the fertilizer market had been transformed into a competitive market with minimal presence of the public sector. There was an interruption in this trend in 1995, however, when the Government

⁸El Guindy et al., “Marketing and Price Policies for Nitrogen Fertilizers in Egypt,” APRP RDI Unit Report No. 22, December, 1997, p. 68.

⁹World Bank, “Arab Republic of Egypt: An Agricultural Strategy for the 1990s,” Report No. 11083-EGT, December, 1992, p. 63.

reintroduced the monopoly of PBDAC with respect to domestically produced nitrogen fertilizer. Exports from the producing factories, decreased production due to simultaneous shutdowns for maintenance at more than one factory, and import duties brought on a “crisis” in nitrogenous fertilizer supplies and prices. The GOE temporarily exempted fertilizer from duties, and large quantities of imports flowed in. Since then the private sector has gradually regained its position as the dominant distribution channel for chemical fertilizers.

The results (see Table 4-1 and Figure 4-1) illustrate the effect of the reforms and the crisis. The private sectors’ share increased from zero at the beginning of the decade to about 70% in the summer of 1995, after which PBDAC became the only entity to receive fertilizer from the factories. When the effects of the “crisis” receded, the Bank’s share was gradually reduced, so that for 1997/98 (through May), the share of the private sector had returned to more than 50%.¹⁰

Table 4-1: Distribution of Nitrogenous Fertilizer, 1989/90 to 1997/98

(Percent)

Year	PBDAC	Private ^a	Cooperatives	Public Sector ^b
1989/90		0.0 ^c		
1990/91		0.0 ^c		
1991/92	48.3	24.7	18.0	9.0
1992/93	0.0	60.4	14.9	24.8
1993/94	13.5	63.7	20.9	1.8
1994/95	8.6	70.7	20.2	0.5
1995/96 ^d	94.2	3.5	1.3	0.9
1996/97	59.1	4.1	19.1	17.7
1997/98 ^e	22.0	51.3	22.0	4.7

Sources: Ministry of Public Enterprise, Fertilizer Council; *Fertilizer Policy Impact Study* (Final Report) International Fertilizer Development Center, June 1993

^a Most of this fertilizer goes to the domestic market; a very small part is exports.

^b These are public companies that take fertilizer from the factories, earn a commission, and resell to wholesalers. See Zalla and Saad.

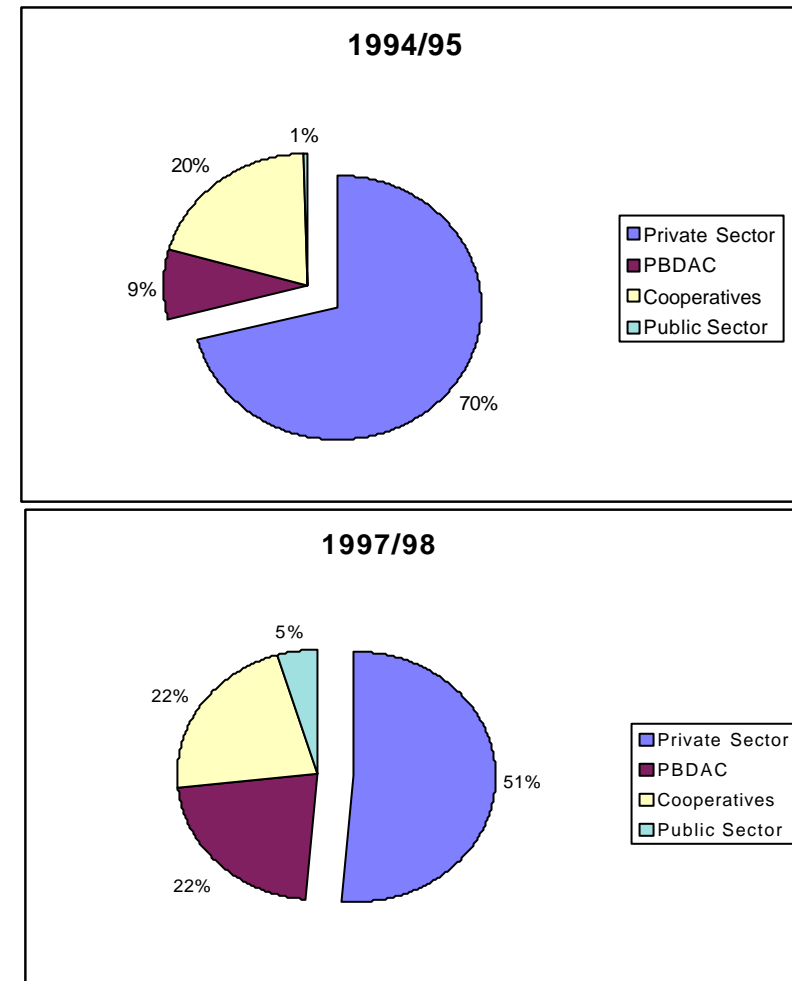
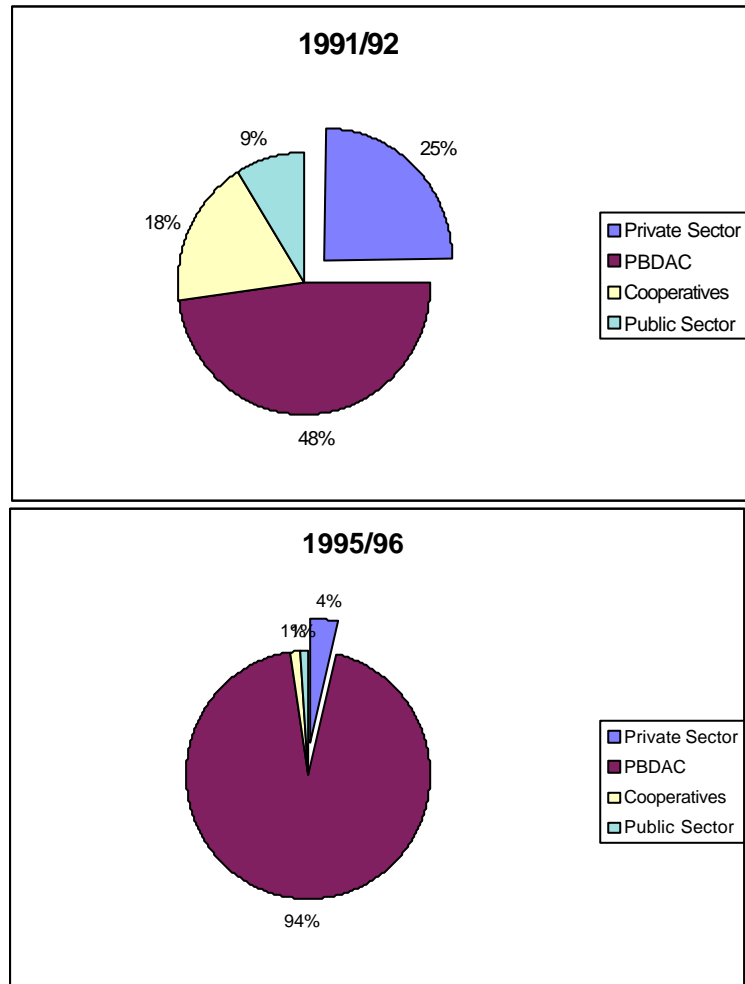
^c It was illegal for the private sector to distribute fertilizer before July, 1991.

^d From August 5, 1995 through December, 1995 PBDAC handled 100% of the nitrogen fertilizer. This estimate does not cover the period from July 1 to August 4, 1995.

^e This percentage of the distribution for the private sector covers the period from Jul 1, 1997 through May 31, 1998.

¹⁰By June, 1998 the share of PBDAC had fallen to less than 10 percent (MVE Unit, Verification Report, APRP, Tranche II, pp. 7-8).

Figure 4-1: Distribution of Nitrogenous Fertilizer



5. PRIVATE SECTOR SHARE OF VOLUME OF SEED COTTON TRADE, GINNING, AND SPINNING

Definition of Progress Indicators

These indicators are defined simply as the share going to the private sector of the trade and processing of cotton products, namely seed cotton, lint, and yarn. Each indicator shows the amount of the activity carried out by private agents as a proportion of the total.

5a. Private Sector Share of Volume of Seed Cotton Trade

Relationship of Progress Indicator to Reforms under APRP

Under APRP, and before it APCP, the GOE has been working toward a cotton marketing system in which the private sector plays the dominant, if not the exclusive role. It has used both privatization and liberalization to accomplish this goal. The private sector was allowed to enter into seed cotton marketing and ginning in 1994/95. These indicators show directly whether this goal has been achieved in the specific areas of seed cotton marketing, ginning of seed cotton into lint, and spinning of lint into yarn.

Sources of Information

CATGO

Cotton textile holding companies

ALCOTEXA

Private ginning companies

MVE survey of private spinners

Calculation of Progress Indicator

The measurement of these indicators is fairly straightforward. The only choices for calculation are whether to use the input or the output side of the processing operations. For ginning the data are the quantities of lint produced, and for spinning the indicator measures the amount of yarn produced. These choices were dictated by the availability of data, but they do not introduce any significant bias into the results.

Results and Analysis

Table 5a-1 shows the volatile nature of this indicator, which has been influenced directly by the Government's policies. It should be stated first that because of the structure of the seed cotton market in Egypt, this indicator is always an *understatement* of the actual participation of the private sector. That is, seed cotton is usually sold by producers in "rings" operated by PBDAC, and it is also sometimes sold outside of those rings. Sometimes commission agents or traders—both registered and unregistered—buy the seed cotton from farmers and bring the cotton to larger trading companies, both public and private. These companies have the cotton graded in their name at the ring and then move the cotton to the gin. This indicator measures the seed cotton that arrives in the gins. By this time, some of the cotton has changed hands more than once, sometimes going from private ownership to public, whereas in the seed cotton form, it never goes from public ownership to private.

In 1994/95 the seed cotton marketing arena was opened to the private sector, which took an encouraging 30 percent stake in these activities. The participation of the private sector started with one main buyer (El Ahly Co.), who also leased a number of public gins, and two other companies.

The following year showed an even more remarkable 53-percent share for the private companies. This growth in the participation of the private sector came through an increase in the number of private companies participating, which reached about a dozen. This large increase came despite a ban on exports of lint that lasted until February, 1996. The Government sought to meet the needs of the domestic spinning mills first. Exports in 1995/96 were the second lowest in the decade.

In 1996/97, the private sector was hit with the impact of the Government's efforts to give farmers a high price for their seed cotton. The GOE estimated the support price based on what turned out to be a temporary spike in world cotton prices in 1996. The private sector did not participate at all that year because the floor prices were higher than world prices. Private sector representatives asked for a mechanism to compensate them for the difference between the two prices, but the reply came only in the following year.

In the fourth liberalized season, 1997/98, private sector deliveries of seed cotton to gins was limited to about 5% of the crop. There were only three private buyers, two of them S Modern Nile Company and Arabeya Ginning Company S under one group; the third buyer was Arab Trade and Investment Company.¹¹ Floor prices were again higher than world prices, but, partly on the advice of APRP, the GOE instituted a deficiency payment scheme to compensate traders for the difference. Unfortunately the scheme was developed too late in the season to be implemented successfully. It also included a prohibitive requirement for the private companies to make large cash deposits before starting their marketing activities, a requirement that did not apply to public sector companies.

In 1998/1999 at least eleven major private sector companies participated in seed cotton marketing and at least 66 smaller registered and non-registered private traders participated. In this year, the GOE did not announce a floor price before planting, but eventually declared that it would be the buyer of last resort and tied the support price to the opening export prices of lint announced by ALCOTEXA. Prices for some export cottons were sufficiently reasonable that the private sector returned to the marketing arena with a 20-percent share. That is, at these prices the private sector could compete with public trading companies, who were also buying seed cotton, and make a profit.

The Government opened seed cotton marketing to the private sector, by changing the marketing system. Previously PBDAC or cooperatives had operated all marketing rings (where farmers had been required to deliver their seed cotton). In 1994/95 seed cotton was sold in cooperative collection centers, and PBDAC played a very small role in the system. A similar system was used in 1995/96. From 1996/97 on, PBDAC returned to the marketing system in a significant way as the administrator

¹¹In a survey of 74 seed cotton traders in November-December, 1998, MVE learned that 21 sample traders bought 50,700 seed kentars in 1997/98. Excluding one large trader, who became an ALCOTEXA member in 1998/99, these 20 companies bought 20,700 kentars of seed cotton (though they generally do not appear in statistics regarding deliveries to the gins).

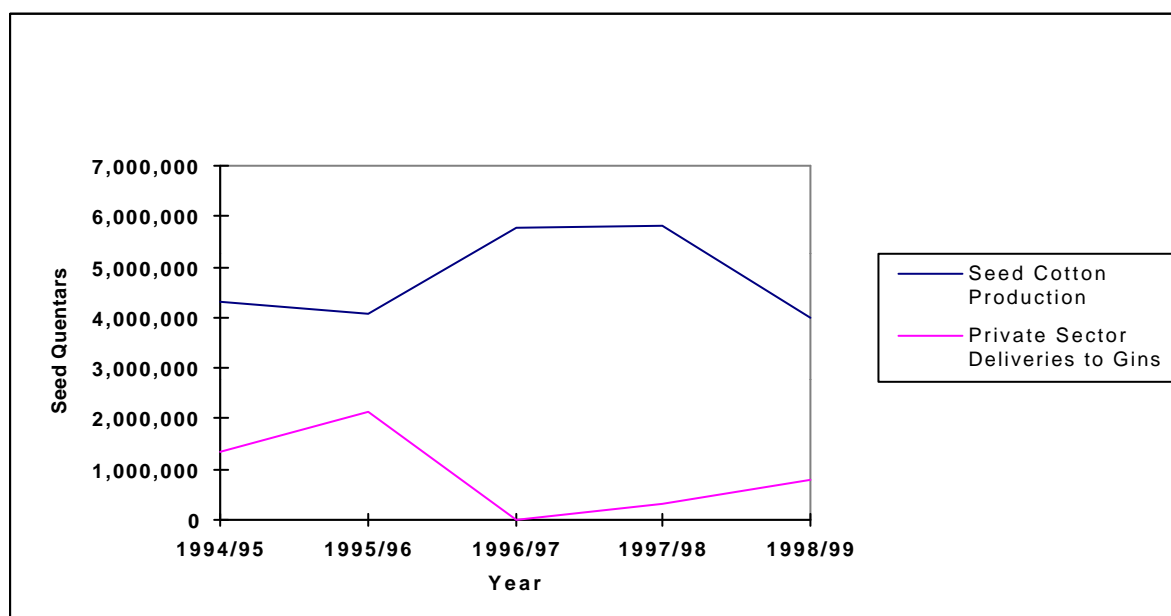
of the marketing rings. In this year of high prices, the private sector did not accept the Government's offer of marketing rings, because the mechanism for compensation was not clear. The following year, 1997/98, the private sector was given first choice of rings, and it chose to buy seed cotton in 55 rings out of the 857 rings in the country. In 1998/99, the private sector again had first choice among the rings. Despite some uncertainty during the production season about the Government's plan for price interventions, by the end of the season the plan became clear, and the private sector chose to buy in about 150¹² out of the total of 892 rings.

Table 5a-1: Deliveries to Gins of Seed Cotton, Private Companies and Total, 1990/91-1998/99

Marketing Year	Private Deliveries (Seed Qentars)	Total Deliveries (Seed Qentars)	Private Share (Percent)
1990/91 - 1993/94	0		0
1994/95	1,331,413	4,317,219	30.8
1995/96	2,146,586	4,061,843	52.8
1996/97	7,410	5,761,146	0.1
1997/98	296,181	5,841,666	5.1
1998/99	782,260	3,985,357	19.6

Source: CATGO

Figure 5-1: Private Sector Share in Seed Cotton Trade, 1994/95 to 1998/99



¹²The actual number is 149, plus the number of private rings in Fayoum, data for which were not available.

5b. Private Sector Share of Volume of Cotton Ginning

Relationship of Progress Indicator to Reforms under APRP

Under APRP the GOE has undertaken to privatize the ginning industry. Two ginning companies have been privatized, and the remainder are expected to be privatized soon. This indicator shows the results of those privatizations and the results of new investment in ginning by measuring the amounts of lint produced by private gins as a share of the total.

Sources of Information

Holding Company for Cotton and International Trade

Calculation of Progress Indicator

See definition.

Results and Analysis

During the period 1961-94, all the cotton trading, ginning, spinning, weaving and exporting were carried out by the Government. Thus before 1996 the five cotton ginning companies were owned by the public sector. Beginning in 1996, two of these companies were sold to private investors as follows:

Arabia Cotton Ginning Company. This was sold to the private sector in 1996, including its 14 mills. The investors then added the following investments:

- C The company bought El Baraka mill from the private Egypt Company for Cotton and provided it with a new press and farfara hall to prepare cotton bails for export directly from the mill.
- C The company also provided three of its mills at Senbelawein, Samanoud and Damanhour with three used presses.

El Nile Cotton Ginning Company. The company was sold to a private investor in 1996/97, including its 16 mills.

- C The company added four new hydraulic press systems in three mills to produce standard cotton bales for export directly from the gins.

Nefertiti Cotton Company. Its in Minia, including 50 ginning machines, and provided it with a new hydraulic press.

Nassco Cotton Company. The main activity is in cotton trading and exporting. Recently the company began adding new investments to cotton ginning sector represented in providing three cotton mills related to Delta Company for Cotton Ginning at Kafr El Dawar, Sherbein and Desouk with advanced hydraulic presses which produce universal density (UD) bails for exporting directly from these gins. The company has also taken a new direction in organizing a system to remove different sources of contamination from the seed cotton before ginning.

From Table 5b-1, one can see that the share of the private sector in ginning has reached about 40 percent in 1998/99. This reflects the dynamic nature of this industry. As mentioned above, the new investors are rationalizing the production systems of the gins they have purchased by selling some gins, improving the equipment in others, and generally improving the quality of the lint produced. These are the kinds of actions one would expect when the management of the gin has a direct profit incentive. The share of the private sector in ginning is likely to reach 100 percent in the coming year or two, as the Government seems seriously committed to selling its remaining gins.

5c. Private Sector Share of Volume of Cotton Spinning

Relationship of Progress Indicator to Reforms under APRP

Under APRP the GOE has begun the privatization of spinning mills. In addition a substantial number of private investors have entered this industry. A recent MVE survey discovered about twenty private spinners of relatively large scale, in addition to more than one hundred smaller companies operating the Fowah area using various types of cotton waste as input. The indicator shows the effects of the privatization and private investment as measured by the amount of yarn produced.

Sources of Information

MVE spinner survey
CAPMAS
CITHC

Calculation of Progress Indicator

See definition.

MVE conducted a survey from a population of 33 spinners. Of these, 12 spinners in Fowah are traditional spinners. The survey team could not reach three modern private spinners (Giza Spinning, KABO, and one mill belonging to Mr. Samir Riad). The results exclude those for Amreya and Miratex, as MVE does not consider them private. Minya El Qamh has been privatized only as of 1999/2000, so it, too, is excluded from these results. Thus in addition to the 12 spinners from Fowah, the results include 15 modern private spinners. Of the 15, 12 are entirely new investments, and three are privatized through ownership (Unirab and Alexandria S&W) or leasing (DIP-Egypt). In the planned extension of the spinner survey (fall, 1999), MVE will include those not reached in the first round and additional newly discovered spinners, which are approximately ten in number.

Table 5c-1 shows the share of the private sector in yarn spun in Egypt. The share increased from less than five percent in 1990/91 to over 30 percent by 1998/99. This accompanied the increase in number of companies. In 1990/91 there were about 55 companies operating in Fowah and about five other private spinners in production in Egypt, according to the MVE spinner survey. By 1998/98 these numbers had increased to 134 and 14, respectively.

Results and Analysis

The share of yarn spun by the private sector increased steadily and rapidly in the 1990s. The rate of increase of the share was about 30 percent per year. The GOE has privatized three affiliated spinning

companies since 1997/98 and leased out one major unit of another. The private sector invested in more than a dozen new medium-scale operations, and the smaller traditional spinners also continued to increase in number and size. The complex set of policies affecting the decision to invest in spinning seems to be more conducive at the end of the 1990s than at the beginning. In addition spinners have been able to find productive niches, either by spinning the cotton waste of the spinning and weaving industry, or by producing high-quality yarns for specific foreign clients.

Table 5b-1: Cotton Ginned by Ginning Company (Lint & Scarto), 1990/91 - 1998/99

(kentars)

Company	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99
Al Ahli***	0	0	0	0	1,101,601	1,015,787	572,125	0	0
Modern Nile***	0	0	0	0	11,710	36,769	0	0	0
Nefertiti***	0	0	0	0	168,824	137,781	170,300	104,159	51,634
Egypt***	0	0	0	0	0	23,033	12,900	0	0
Arabeya Ginning**	1,084,501	1,076,864	1,404,810	1,707,108	623,357	682,915	898,286	1,290,440	940,800
Nile Ginning**	1,013,175	1,008,040	1,333,563	1,735,422	988,958	959,858	1,011,108	990,399	822,689
Delta Ginning	1,490,918	1,388,336	1,732,643	1,964,652	879,962	991,221	1,463,161	1,541,761	*1,051,194
Misr Ginning	1,383,057	1,437,864	1,531,969	1,609,996	933,808	469,426	1,328,783	1,524,318	971,179
El Wadi Ginning	930,703	946,976	1,127,758	1,283,374	771,792	499,328	1,402,760	1,376,135	741,264
Total	5,903,354	5,858,080	7,130,743	8,300,552	5,480,012	4,816,118	6,888,049	6,827,212	4,578,760
Private Sector Share (Cotton ginned in privately owned gins)	0	0	0	0	0	0	898,286	2,280,839	1,782,152
Percent	0	0	0	0	0	0	13	33.4	38.9
Private Sector Share (Cotton ginned in privately owned or leased gins)	0	0	0	0	1,282,135	1,213,370	1,653,611	2,384,998	1,815,123
Percent	0	0	0	0	23.4	25.2	24	34.9	39.6

Source: Holding Company for Cotton & International Trade

Notes: Heavy line contains cotton ginned under private ownership or lease.

*Nassco had a contract with Delta Ginning in 1998/99 to gin its seed cotton and to use cleaning and pressing lines so Nassco could export directly from the gins, but none of this cotton is included as private because the gin is public.

**Arabeya Ginning and Nile Ginning were public sector companies until privatized in 1996/97 and 1997/98 respectively.

*** These private companies leased and managed public sector gins for several years beginning in 1994/95. Nefertiti has a five-year contract with Nile, and Nile was privatized during this time. Cotton ginned by Nefertiti is included under private leased in all five years. In the last year, Nefertiti also operated its own gin. The breakdown of the cotton ginned by Nefertiti in 1998/99 is as follows: 32971 (leased), 18663 (owned).

Table 5c-1: Private Sector Share of Volume of Cotton Spinning, 1990/91 - 1998/99

Year	Public Sector*		Private Sector***						Total Yarn (Tons)
	Quantity (Tons)	Share (%)	Number of Factories (Fowah) ⁽¹⁾	Production per Factory (Fowah) ⁽²⁾	Total Production (Fowah)	Total Production (Non Fowah)	Total (Tons)	Share (%)	
1990/91	527,437	96.3	55	76.80	4,224	15,990	20,214	3.7	547,651
1991/92	266,946	92.6	65	77.40	5,031	16,232	21,263	7.4	288,209
1992/93	279,196	91.7	70	120.56	8,439	16,742	25,181	8.3	304,377
1993/94	281,127	91	80	137.84	11,027	16,630	27,657	9	308,784
1994/95	269,375	85.5	90	174.89	15,740	30,054	45,794	14.5	315,169
1995/96	249,614	79.7	95	172.08	16,348	47,281	63,629	20.3	313,243
1996/97	239,447	77.8	110	162.88	17,917	50,426	68,343	22.2	307,790
1997/98	200,109	72.9	120	163.88	19,666	54,904	74,570	27.1	274,679
1998/99	201,959* *	69.2	134	233.88	31,340	58,611	89,951	30.8	291,910

Sources: * CAPMAS

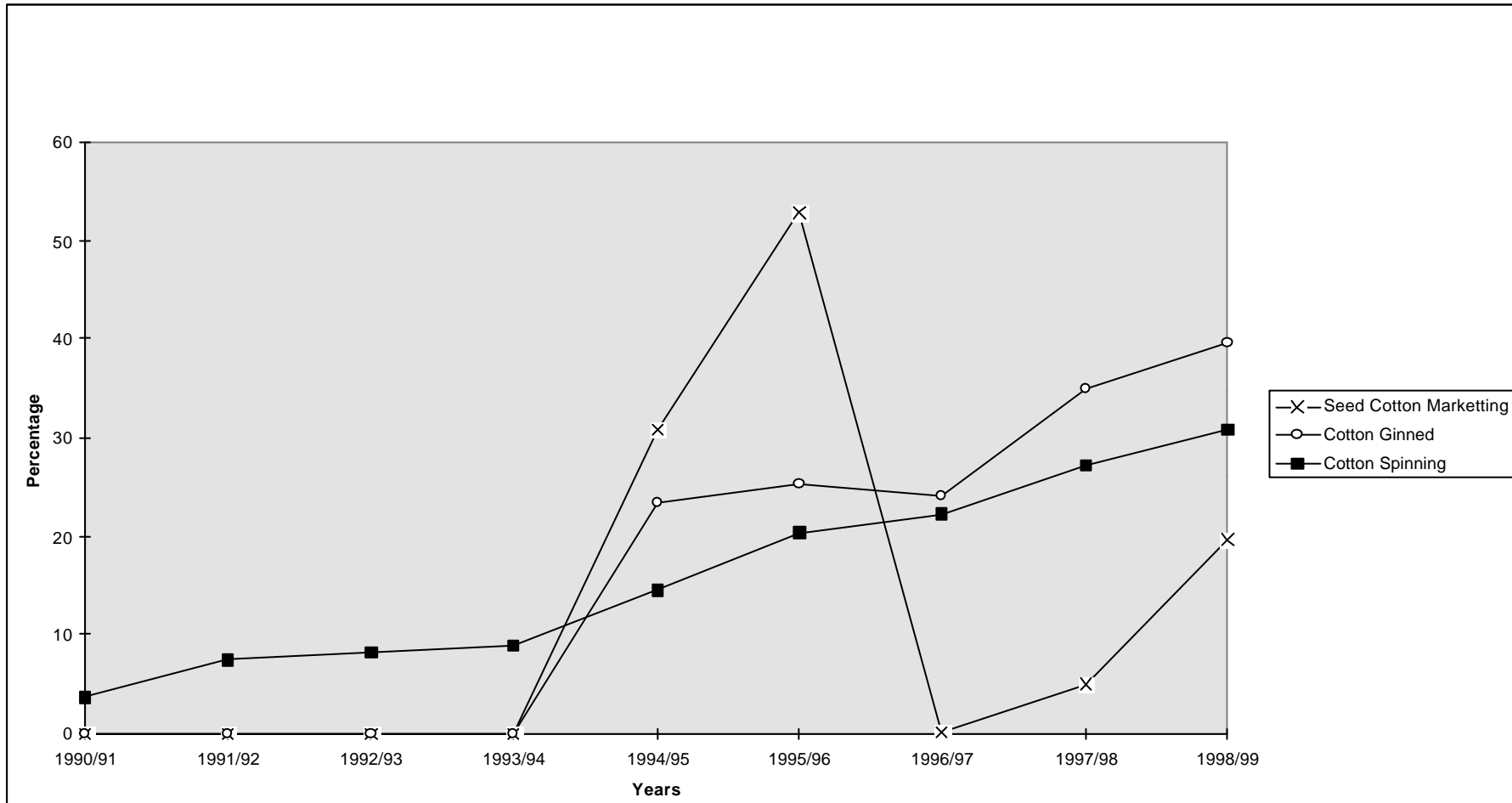
** CITHC

*** MVE Cotton Spinners Survey, 1999.

Notes: ⁽¹⁾ Estimated by Fowah informants.

⁽²⁾ Number of surveyed companies operating was 3 in 1990/91, 4 in 1991/92, 5 in 1992/93, 5 in 1993/94, 9 in 1994/95, 10 in 1995/96, 12 in 1996/97, 12 in 1997/98, and 12 in 1998/99.

Figure 5-2: Private Sector Shares in Seed Cotton Marketing, Ginning and Spinning, 1990/91-1998/99



6. PRIVATE SECTOR SHARE OF VOLUME OF WHEAT MILLING

Definition of Progress Indicator

This indicator is defined as the share of all wheat that is ground in mills owned by the private sector. The intention of the indicator is to capture the effects of new private investment in mills. Thus the focus should be on milling by large, commercial mills. There are also a large number of small local mills that have existed for a very long time.

Relationship of Progress Indicator to Reforms under APRP

Reforms under APCP and under APRP tranche I attempted to liberalize the 72% wheat flour market for entry by the private sector. The private sector is not yet allowed to purchase Egyptian wheat for milling into 72% flour, but it may import wheat for this purpose. Milling was opened to the private sector in September, 1993 and it was officially confirmed in May, 1997 that the (commercial-scale) private sector could purchase only imported wheat.¹³ Wheat is also milled to 82% extraction in the subsidized market, where some of the milling is done by the private sector on contract to the public sector. This indicator captures the effects of policy reforms promotingS and of any obstacles constrainingS the opening of wheat milling to the private sector. Expansion of private wheat milling is likely to continue. A significant potential problem exists for these new modern mills, however, if there is no privatization of the older public mills: the latter have unfair cost advantages.

Sources of Information

MTS

CAPMAS

MALR

Calculation of Progress Indicator

The indicator is calculated based on the total wheat milled by the private sector, and for comparison based on only the amount milled in large, commercial mills.

Results and Analysis

Table 6-1 shows the amounts of wheat milled on a commercial scale by the public and private sectors. That is, milling by small village mills is not included here. Once the private sector began building mills and importing wheat (after 1995), the share of wheat milled increased from about 10 percent at the beginning of the decade to almost 20 percent in 1997. Construction continues and the share is expected to increase significantly in the coming years. According to Tyner (1999), the capacity of private fino (72%) mills operating at the end of 1997 was 2,510 mt/ day. By the end of 1998, it was estimated that the capacity would have increased by 2,820 mt/day and an additional capacity of more than 1,300 mt/day was in the serious planning stage by different potential investors.

¹³Verification Report, Agricultural Policy Reform Program, Tranche I: Policy Benchmarks for Accomplishment by June 30, 1997. July, 1997.

Small village mills may currently grind about 4 million tons of wheat per year. If this wheat is added to that milled by the commercial-scale private sector, the share of the private sector would rise to more than 45% in 1997.

Table 6-1: Wheat Milled by the Public Sector and by Commercial-Scale Private Mills, 1990-97

(000 tons)

Year	Private Sector			Public Sector (72% & 82%)	Grand Total	Private Sector's Share
	82% Flour	72% Flour	Total			
1990	619	0	619	5043	5662	10.9%
1991	593	0	593	5074	5667	10.5%
1992	598	0	598	5113	5711	10.5%
1993	635	0	635	5038	5673	11.2%
1994	666	0	666	5373	6039	11.0%
1995	645	0	645	6948	7593	8.5%
1996	662	396	1058	6254	7312	14.5%
1997	690	863	1553	6426	7979	19.5%

Source: MTS

7. PRIVATE SHARE OF EMPLOYMENT IN COTTON GINNING AND SPINNING

Definition of Progress Indicator

This indicator is defined as the number of workers in private ginning or spinning divided by the total number of workers in that industry.

7a. Private Share of Employment in Cotton Ginning

Relationship of Progress Indicator to Reforms under APRP

See indicator 5. The effects of privatization and liberalization will appear in both output and employment.

Sources of Information

CAPMAS

Private ginning companies

Calculation of Progress Indicator

See definition.

Results and Analysis

Cotton ginning was a private industry until the 1960s, when it was nationalized. The investors in the ginning industry were mainly the large cotton traders and exporters, whose gins were integrated with other activities such as trade in seed cotton and export of cotton lint.

As a part of its reform policies, and the liberalization and privatization policies affecting the cotton trade and ginning, export, spinning, weaving and ready-made garment industries, the Government of Egypt began to privatize some of the ginning companies starting in 1996/97. There are three large public companies that have not yet been privatized. These three companies are Delta, Misr, and Wadi, but these companies are on the top of the privatization list for the Ministry of Public Enterprises and stated for sale in the season. Of the other two companies, Arabeya was privatized in 1996/97, and Nile, in 1997/98. In addition to this, there are some other ginning companies that started operating as private companies as a result of the new environment of reform and liberalization. These companies are Nefertity, Baraka, and Nassco, which has a special agreement with Delta to gin all of its cotton under which Nassco provides cotton presses and new cleaning equipment.

From 1989/90 to 1998/99 total employment in public ginning companies declined from 8,739 to 4,111. Employment at Delta declined rapidly, at Misr it declined steadily, and at Wadi it changed little. Total employment at privately owned gins increased from zero in 1994/95 to 3,538 in 1998/99. Arabeya and Nile were privatized, and other private startups added to the total employment in the sector. As a result of these changes, the private share of employment increased from zero in 1994/95 to almost 25 percent in 1996/97 to over 45 percent in 1998/99.

In the most recent year, employment declined at all of the five original ginning companies, probably in response to competitive forces and overcapacity in the industry existing after significant decreases in the production of seed cotton.

7b. Private Sector Share of Employment of Cotton Spinning

Relationship of Progress Indicator to Reforms under APRP

See indicator 5. The effects of privatization and liberalization will appear in both output and employment.

Sources of Information

HCSWRMC

Chamber of spinning & weaving Industry.

TCF

CITHC

Private firms

Calculation of Progress Indicator

See definition.

Results and Analysis

The spinning industry is one of the most important employers in Egypt. It operated as a private industry until the early 1960s, when it was nationalized. With the implementation of the Economic Reform and the Structural Adjustment Program (ERSAP), the Government allowed the private sector to re-enter this industry. It also undertook a privatization program that includes the textile industry. Specifically, in 1997/98, two spinning companies began their first full year of operation as private companies, having been privatized during the previous months. They are KABO and Unirab. The following year Alexandria Spinning and Weaving joined them. In 1998/99 one unit of Esco leased by Dong-Il began private operation.

The private and public sectors now compete in domestic and international markets. The spinning industry currently faces tough competition, especially because of the lower prices of international producers compared to the local private and public ones. The private sector has the advantages of lower costs of production, advanced technology, flexibility in setting prices, and more efficient operations compared to the public sector. This flexibility includes the ability to retrain workers for new tasks, thus preserving the level of employment while making the overall operation more efficient.

Due to the reform policies, the new environment, and the liberalization and privatization efforts, private investment in spinning is growing, and the shares of the private sector in the production of yarn and employment are growing, too. It can be seen from Table 7b-1 that the number of employees has been decreasing in the public sector, while it is increasing in the private sector. While privatization is a rather recent phenomenon, investment in private spinning facilities has been going on for several years. Data from the MVE spinning survey show that significant investments in modern facilities^Sas measured by the number of companies^Shave occurred since about 1997/98.

Table 7a-1: Employment in Public and Private Cotton Ginning Companies, 1989/90 - 1998/99

Season	Public Companies			Privatized Companies				Private Companies			Total Employees			Shares (Percent)	
	Delta	Misr	Wadi	Nile		Arabia		Egypt Baraka	Nefertity	Nassco					
				Public	Private	Public	Private				Public	Private	Total	Public	Private
1989/90	2,073	1,710	1,508	1,633	0	1,815	0	0	0	0	8,739	0	8,739	100.00	0.00
1990/91	2,087	1,667	1,520	1,620	0	1,830	0	0	0	0	8,724	0	8,724	100.00	0.00
1991/92	2,096	1,630	1,535	1,665	0	1,873	0	0	0	0	8,799	0	8,799	100.00	0.00
1992/93	1,980	1,554	1,557	1,671	0	1,820	0	0	0	0	8,582	0	8,582	100.00	0.00
1993/94	1,946	1,529	1,494	1,652	0	1,835	0	0	0	0	8,456	0	8,456	100.00	0.00
1994/95	1,735	1,512	1,466	1,629	0	1,805	0	0	0	0	8,147	0	8,147	100.00	0.00
1995/96	1,290	1,578	1,540	1,628	0	1,779	0	210	0	0	7,815	210	8,025	97.40	2.60
1996/97	1,242	1,586	1,521	1,633	0	0	1,712	180	0	0	5,982	1,892	7,874	76.00	24.00
1997/98	1,487	1,640	1,518	0	1,548	0	1,575	240	0	0	4,645	3,363	8,008	58.00	42.00
1998/99	1,256	1,375	1,480	0	1,490	0	1,510	254	150	134	4,111	3,538	7,649	53.75	46.25

Source: Unpublished data from public and private cotton ginning companies.

Note: Nefertiti leased gins from 1994/95 - 1998/99, but no employment is included here, because the employees remained public sector employees of the lessor, Nile Ginning.

The MVE survey¹⁴ covers traditional and modern spinners. The traditional sector is represented by a large number of companies in the area of Fowah in the northern Delta. These companies have been in existence for a long time, sell mostly to the local market, use the same technology, and often replicate themselves in the same area in the form of new plants with almost exactly the same features. Most of these spinners use waste products as their input. Modern spinners, on the other hand, typically make new, individual investments in metropolitan areas or new communities like 6th of October, use newer technology, and often produce for the export market. Most of these spinners are not using waste products as input but rather use cotton lint. Some of these spinners produce high-count yarns, whereas none of those in Fowah do so.

The privatization of two of the three spinning companies transferred more than 11,000 employees from the public to the private sector. New investment in the private sector, in addition to privatization, brought the total employment in private spinning to more than 20,000 by 1998/99. Thus the measured private sector share of employment reached 11%, compared to less than 1% in 1992/93, the earliest year for which data are available for the public companies.¹⁵ Some private companies could not be included in the recent MVE survey¹⁶, so the actual share of the private sector is higher.¹⁷ According to MVE's survey, there were at least five privately initiated modern spinning companies operating in 1990/91, and by 1998/9 there were at least 18 privately initiated or privatized modern spinners operating¹⁸.

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MVE conducted a survey from a population of 33 spinners of cotton or cotton blends. Of these, 12 spinners in Fowah are traditional spinners. The survey team could not reach 3 modern private spinners (Giza Spinning, KABO, and one mill belonging to Mr. Samir Riad). The results exclude those for Amreya and Miratex, as MVE does not consider them private. Minya El Qamh has been privatized only as of 1999/2000, so it, too, is excluded from these results. Thus in addition to the 12 spinners from Fowah, the results include 15 modern private spinners. Of the 15, 12 are entirely new investments, and three are privatized through ownership (Unirab and Alexandria S&W) or leasing (DIP-Egypt). In the planned extension of the spinner survey (fall, 1999), MVE will include those not reached in the first round and additional newly discovered spinners, which are approximately ten in number.

¹⁵1992/93 was the year in which the nationalized companies were transferred to holding companies that were to manage them in a commercial manner and prepare them for privatization.

Table 7b-1: Private Sector Share of Employment of Cotton Spinning, 1992/93 to 1998/99

Season	Public Sector ¹		Private Sector ²					Total
	No. of Employees	Percent	Privatized	New	Traditional	Total	Percent	
1992/93*	206,653	99.2	—	342	1,400	1,742	0.8	208,395
1993/94	203,329	98.9	—	435	1,840	2,275	1.1	205,604
1994/95	192,465	98.6	—	470	2,250	2,720	1.4	195,185
1995/96	183,796	98.3	—	473	2,625	3,098	1.7	186,894
1996/97	178,949	98.0	—	526	3,162	3,688	2.0	182,637
1997/98	172,690	93.5	7,550	725	3,740	12,015	6.5	184,705
1998/99	162,453	89.9	11,623	980	5,673	18,276	10.1	180,729

Sources: 1- CITHC, TMT-HC, HC-SWRMC

2-MVE Cotton Spinners Survey 1999

* This is the first year for which data are available from the public sector companies.

8. IRRIGATED AREA UNDER WATER USER ASSOCIATIONS

Definition of Progress Indicator

This indicator is defined as the irrigated area under private water user associations (WUAs). A WUA is a voluntary association established by farmers to serve their needs in irrigating their land. WUAs are responsible for a number of activities, including participating in the mesqa improvement process (selecting the type of mesqa, locating the new mesqa, locating mesqa turnouts), operating and maintaining the single point lift pump, scheduling turns among water users, resolving disputes, and mesqa maintenance.

Relationship of Progress Indicator to Reforms under APRP

Formation of WUAs began under the IIP. Both APRP and other projects in which MPWWR has enlisted foreign cooperation are attempting to spread the benefits of WUAs as broadly as possible. Water user associations may now be formed at the mesqa level. A ministerial decree allowed for the formation of some WUAs at the branch canal level, and in the future this may be possible in all of Egypt. This indicator will capture the spread of the WUA concept and its operationalization.

Sources of Information

Eng. Essam Barakat, MPWWR

Calculation of Progress Indicator

The definition is straightforward. One distinction that emerged during the collection of data is that the total area covered by WUAs may be different from the area under WUAs that is actually improved and operated by the WUA. These two sets of data are shown in Tables 8-1 and 8-2.

Results and Analysis

From Table 8-1 one sees that the number of WUAs more than tripled from 1990 to 1997. A large part of this increase occurred between 1990 and 1991, when the number of WUAs nearly doubled. The area served by WUAs showed the same trends, increasing from 31,000 feddans at the end of 1990 to more than 110,000 feddans at the end of 1997.

In terms of mesqas actually in operation, the area increased from a token amount to nearly 60,000 feddans by the end of 1997.

One may expect that if WUAs are formed on branch canals, the total area covered by WUAs will increase rapidly again. Similarly, if the MPWWR promotes water boards, this may also increase the coverage of WUAs.

Table 8-1: Number of WUAs Established and the Area They Served, 1991 to 1997

Year*	Number of WUAs	Area (Feddans)
1990	568	31,244
1991	1,043	58,285
1992	1,121	68,882
1993	1,228	78,684
1994	1,339	86,395
1995	1,485	90,517
1996	1,609	97,297
1997	1,816	111,147

Source: Ministry of Public Works and Water Resources, Irrigation Improvement Project

* At the end of the year

Table 8-2: Number of Mesqas in Operation and the Area They Served, 1991 to 1997

Year*	Number of Mesqas	Area (Feddans)
1991	14	492
1992	28	943
1993	152	7,089
1994	344	23,109
1995	543	32,067
1996	854	49,050
1997	981	58,364

Source: Ministry of Public Works and Water Resources, Irrigation Improvement Project

* At the end of the year

9. AGRICULTURAL PRODUCTION PER UNIT OF WATER

Definition of Progress Indicator

This indicator is defined as the aggregate level of agricultural production divided by the amount of water. Aggregate production refers to crops, since water use for the production of livestock is not significant. Major crops and areas of the country are selected for inclusion in the indicator based on their importance and the availability of data. Water can be measured as the total water that might flow onto agricultural fields, or the net amount that is available, not counting reuse. Further details are given below, under “Calculation of Progress Indicator.” In both cases the water measured is that in the Nile System; it does not include groundwater in the New Valley and other sources of deep groundwater.

Relationship of Progress Indicator to Reforms under APRP

One of the overall goals of APRP is to increase productivity in the agricultural sector. Water is one of the most important inputs in the agricultural sector. Thus an indicator measuring the amount of production per unit of this scarce resource is particularly appropriate. The same indicator has been one of USAID’s indicators for its Strategic Objective number 1.

Sources of Information

MALR

MPWWR

Calculation of Progress Indicator

For aggregate production, crops that are included are those that are cultivated on the Old Lands, thus excluding cultivated area in some governorates (Alexandria, Ismailia, Port Said, Suez and Luxor). These crops do not include fruits, nor is livestock production included. Potatoes and tomatoes are the only two vegetables crops that are included; these two crops occupied 52.5% of the total cropped area under vegetables in 1997. Crops omitted were omitted either because their contribution to production was insignificant or because of a lack of reliable data.

A weakness of the indicator as calculated is that it does not include tree crops. These were omitted for lack of reliable and comprehensive data. Output and income of horticultural products is likely to have been growing rapidly in Egypt. The data also omit all production and income on the New Lands, another area where productivity and income are likely to have been growing. These data were also not available. Omitting all of these data creates a bias in the indicator, probably downward.

Aggregate production is estimated by combining the physical quantities of production through the use of price weights. These weights are the average farmgate prices of the crops during the period 1994-96.

Water productivity is examined in two ways: first, as water excluding the reuse of the water and the groundwater; second, as all water that goes to the agricultural sector. Water flowing to the agricultural sector is used to irrigate fields and then recharges the shallow groundwater in the same area. It can be and is pumped from the groundwater to supplement surface water supplies. There is some reuse of

water also by pumping water out of agricultural drains (which are basically canals at lower levels than the canals that supply the water to begin with). The two measures give alternate ways to view the water supply: gross water going to the sector and net water supplied.

While production is measured on the Old Lands, some of the water included in these calculations may be going to the New Lands. It is presumed that such amounts are quite small especially at the beginning of the period in question.

Results and Analysis

The results of the calculations are shown in table 9-1. Neither measure of water changes much over the period in question. This is because Egypt's supply of water in the Nile is fixed by agreement with other countries in the Nile basin and can only increase slightly when rainfall in the Nile watershed is very high. Similarly the physical attributes of the Nile system do not change rapidly either, so the gross amount of water yields approximately the same net amount of water. If intermediate drainage reuse becomes more common, then the relationship between gross and net amounts of water may change.

The level of aggregate production increased over the period 1990-97; it was about 11 percent higher in 1997 than in 1990. Thus the amount of production per unit of water also increased relative to each measure of water. This shows that Egyptian farmers were able to produce more of the crops measured on the Old Lands using nearly the same amount of water, or that their efficiency of water use seemed to have increased.

If horticultural products other than potato and tomato had been included in the indicator, it would likely have increased faster. Similarly, if there were data available to reliably calculate the aggregate production in the New Lands and these were included, the indicator would likely have increased more rapidly. In both cases the indicator would increase faster because horticultural production is increasing and uses less water than rice and sugarcane, which are a large component of the crops included.

Table 9-1: Aggregate Agricultural Production per Unit of Water, 1990 - 1997

	1990	1991	1992	1993	1994	1995	1996	1997
Aggregate Production	17,682	17,697	18,456	18,803	18,086	18,930	20,104	19,648
Index Number	100.00	100.08	104.38	106.34	102.29	107.06	113.70	111.12
Water Available ¹	38.24	37.55	38.09	37.80	39.45	39.28	38.91	39.14
Index Number	100.00	98.20	99.61	98.84	103.15	102.71	101.76	102.34
Water Available ²	47.68	47.62	48.11	47.85	49.30	49.62	49.78	50.20
Index Number	100.00	99.87	100.90	100.36	103.40	104.07	104.40	105.29
Productivity of Water ³	462.39	471.28	484.55	497.51	458.52	481.99	516.65	502.07
Index Number	100.00	101.92	104.79	107.59	99.16	104.24	111.74	108.58
Productivity of Water ⁴	370.84	371.62	383.63	392.96	366.86	381.50	403.87	91.40
Index Number	100.00	100.21	103.45	105.97	98.93	102.87	108.91	105.54

Sources: MALR, MPWWR

¹ Water available excluding the irrigation drainage re-use and groundwater

² Total water availability from all sources in Egypt

³ The productivity of water excluding the irrigation drainage re-use and groundwater

⁴ The productivity of water excluding the re-use and groundwater (i.e., using total water availability as the denominator).

10. VOLUME OF PADDY RICE PRODUCTION PER UNIT OF WATER

Definition of Progress Indicator

This indicator is defined as the amount of rice produced divided by the amount of water used in rice production. Rice is measured as paddy. Water is measured as consumptive use, the scientific estimate of the amount of water used by a rice plant.

Relationship of Progress Indicator to Reforms under APRP

Rice is a major crops in Egypt because it is an exportable crop, a cash crop and an important food. In 1997 the area under rice was more than 1.5 million feddans, about 50% higher than in 1990. For these reasons the Government gives significant attention to this crop.

Under APRP the GOE has undertaken a major program of water conservation in rice and sugarcane. This indicator will eventually reflect the benefits of part of that program. The GOE introduced short-season rice varieties several years ago (see Table B10-1) with yields the same or higher than the longer-season varieties, but the benefits of the shorter season have not been captured in the form of water savings. This is because there must be coordination among the farmers and the irrigation engineers to both grow the same or similar rice in large blocks of land and to shorten the irrigation season. Until recently the irrigation engineers were forced to release water as if all farmers were growing long-season rice. The new program promises major savings in water.

The GOE has also attempted to conserve water by restricting the acreage under rice. It has been very difficult for the Government to enforce such restrictions, and the area has increased rapidly in the 1990s. The effects of this policy do not create a problem in interpreting this indicator because the area effect enters the indicator in both the numerator and the denominator.

Sources of Information

MALR

MPWWR

Calculation of Progress Indicator

For each variety of rice, the consumptive use per feddan is estimated based on its total days in the field and the number of days at the end of the season that irrigation is not required. Then the total consumptive use for that variety is estimated by multiplying by the area under cultivation. The total consumptive use for all rice is then estimated by summing the consumptive use over all varieties.

To estimate the indicator, the total production of paddy is divided by the total consumptive use for the actual area under rice, assuming that all varieties were long-season. This is the assumption that the irrigation engineers needed to make during this historical period, so the indicator reflects the productivity of the water that reached the rice growing areas for rice cultivation. Some of this water was “wasted” when short-season rice varieties were grown, because at the end of the season some of the water was not needed.

For comparison the indicator is recalculated to show what would happen if the consumptive use were the amount based on the actual varieties cultivated (i.e., a mixture a short-season and long-season). In addition one can examine the results for 1997 if all varieties are assumed to be short-season.

Results and Analysis

Table 10-1 shows in 1997 that shortest season varieties (125 days) have increased to about 11 percent of the total by area. Medium-length varieties (135 and 145 days) covered another 30 percent of the rice area. Thus the average days to maturity for the 1997 mix of varieties was about 146 days, somewhat less than the maximum 155 days to maturity for the standard, long-season varieties.

The productivity of water in the production of rice increased from 1990 to 1997 from 0.65 to 0.75 metric tons of paddy per thousand cubic meters of water, an increase in efficiency of about fifteen percent. This increase may have been due to increases in water use efficiency at the mesqa level. These might have included a reduction in wastage of the released water reaching the mesqa during the period when there was a dramatic expansion in rice area. Farmers may have found more efficient schedules for planting and irrigation.

The amount of water savings that could have been realized if only short-season varieties (120 days) were grown is about 1.5 bcm, a very substantial amount of water. Of course this is the reason behind the push to implement the short-season rice program with coordinated irrigation and shortened irrigation season.

The change in the indicator in 1997 if it is assumed that all varieties are short-season is quite significant\$from .75 to 1.04 metric tons of paddy per thousand cubic meters of water. Thus these calculations remind one that the rice program can not only save water, it can also make a significant contribution to the efficiency of the agricultural sector.

The short-season rice program is proceeding at a rather rapid rate. GOE officials expect that in the 1999 rice production season about half the total rice area will be covered by short-season varieties.

Table 10-1 : Production of Paddy Rice per Unit of Water, 1990 to 1997

Year	Production of Rice* (Million Tons)	Consumptive Use of Water Long Varieties** (Billion m³)	Production per Unit of Water
1990	3.17	4.89	0.65
1991	3.45	5.18	0.66
1992	3.91	5.73	0.68
1993	4.16	6.04	0.69
1994	4.58	6.49	0.71
1995	4.79	6.60	0.73
1996	4.90	6.62	0.74
1997	5.48	7.31	0.75

Sources: Tables B10-1 and B10-4.

11. RATIO OF EARNINGS OF NON-BANKING ACTIVITIES TO TOTAL EARNINGS, PBDAC

Definition of Progress Indicator

This indicator is defined as the ratio of earnings from non-banking activities to total earnings from all activities. When the ratio increases, it implies that PBDAC is increasingly involved in different commercial activities, including input distribution (fertilizer, pesticides, and seed). When this ratio decreases, it means that PBDAC is moving toward functioning as only a banking institution and eliminating its commercial activities.

Relationship of Progress Indicator to Reforms under APRP

A number of benchmarks under APRP strove to increase the share of the private sector and reduce the share of PBDAC in fertilizer distribution, as well as to increase PBDAC's focus on banking.

Sources of Information

Dr.Hassan Khedr, Chairman of the Board, PBDAC

Calculation of Progress Indicator

See definition.

Results and Analysis

Table 11-1 shows PBDAC's revenue from banking and non-banking activities through the period 1986-1997 by components. The table also shows the relative importance of the non-banking revenues in the total, and the average revenue for each activity and its relative importance.

The ratio of non-banking revenue to total PBDAC revenue declined from about 30 percent during 1990-92 to about 12.5 percent during 1995-97. This is a very substantial decrease in non-banking revenue as a share of the total. The decline would have been even more had PBDAC not been given the task of fertilizer distribution during the fertilizer "crisis" of 1995 and 1996. For example, in 1996 the indicator would have taken the value 8.0 percent instead of 15.3 percent if revenues from fertilizer were removed from the calculation. Now that PBDAC is no longer receiving significant quantities of fertilizer from the domestic factories, it appears that "pesticides" is the major non-banking source of revenue.

Table 11-1: PBDAC Revenue from Banking and Non-Banking Activities, 1986-1997

(LE millions)

Year Activity	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Agric. Credit	73.58	88.78	108.48	141.40	172.21	205.07	196.92	214.18	182.31	220.12	230.12	255.38
Invest. Credit	149.19	212.59	237.98	278.89	333.12	403.03	477.25	456.44	430.15	533.89	534.36	639.8
Banking Operations	19.97	21.93	27.24	30.39	41.38	54.89	-	-	-	-	-	-
Subtotal(1)	242.74.	323.3	373.70	450.69	546.71	662.99	674.37	670.62	612.46	754.01	764.48	895.18
Fertilizers	53.52	54.63	61.92	99.47	111.82	81.56	74.82	22.33	17.56	9.68	66.05	48.72
Seeds	2.9	3.93	5.14	4.91	9.46	11.79	21.43	15.95	9.83	8.46	1.39	0.88
Pesticides	16.28	18.79	21.59	23.76	24.81	32.25	44.93	59.57	53.03	39.17	31.39	25.33
Spare Parts	2.59	2.97	3.14	2.83	2.86	3.02	4.32	5.46	5.17	4.67	4.70	4.96
Supplies Operations	24.86	24.35	25.92	8.93	13.71	20.05	14.21	9.82	6.91	4.40	5.16	3.85
Yellow maize	-	-	-	21.03	45.69	37.76	20.41	3.41	1.09	-	-	-
Feed	10.03	11.5	13.15	13.67	15.23	10.53	5.33	0.03	0.15	0.07	-	-
New bags	8.64	9.02	10.52	8.12	8.65	11.27	14.83	10.86	4.49	2.60	1.47	1.13
Coop marketing	0.02	0.01	-	-	-	-	-	-	-	-	-	-
Crop preservation	0.94	1.21	1.56	1.30	1.98	2.33	4.68	3.83	3.77	3.36	3.47	2.61
Commerical	13.79	18.14	16.87	19.41	22.65	19.89	14.09	18.01	43.81	10.18	14.07	21.17
Storing revenue	-	-	-	-	-	-	-	4.13	5.98	7.61	10.12	10.18
Subtotal (2)	133.57	144.55	159.81	203.43	257.16	230.45	219.05	153.40	151.79	90.2	137.82	118.83
Grand total (1+2)	376.31	467.85	533.51	654.12	803.87	893.44	893.42	824.02	764.25	844.21	902.30	1014.01
Percent Non-Banking (2)/(1+2)	35.5	30.9	30.0	31.1	32.0	25.8	32.0	18.6	19.9	10.7	15.3	11.7

Source: PBDAC

12. AGRICULTURAL RESOURCE INCOME

Definition of Progress Indicator

Agricultural Resource Income (ARI) is the difference between the gross value of agricultural crop production and the cost of current inputs purchased from sources outside the agricultural sector. The objective is to measure the return to land, labor (family and hired), water and capital resources used in crop production. To reflect the purchasing power of the increase in income, the ARI is deflated by a measure of overall price change in the economy.¹⁹

ARI is similar to agricultural value added. It differs in not including all the costs incurred by the producer, especially hired labor. The producer might incur hired labor costs for any number of farm operations, including land preparation, fertilization or manuring, planting, weeding, insect control, harvesting, or threshing. The ARI measure takes the viewpoint of the sector, rather than the firm, in calculating value added. For this reason it is somewhat more an indicator of changes in the terms of trade between the agricultural and non-agricultural sectors; it is somewhat less an indicator of value added by, or income of, the farm household.

Relationship of Progress Indicator to Reforms under APRP

Among the overall goals of APRP are to increase production and productivity in the agricultural sector and thereby to increase incomes of farm households. ARI attempts to measure the income of the sector by examining its value added relative to goods and services from outside the sector. If macro and agricultural policies were successful in increasing agricultural incomes, then the ARI should show an increase.

Sources of Information

MALR

CAPMAS

Calculation of Progress Indicator

This indicator was calculated using the major crops of the Old Lands (Nile valley), namely 24 crops that occupied 87.4% of the total cropped area of the Old Lands in 1997. For each crop the gross value of production, including the value of byproducts, was calculated. From this gross value the following costs were subtracted:

- C Fertilizer (materials only)
- C Pesticides (materials only)
- C Seed (materials only)
- C Fifty percent of machinery costs
- C Miscellaneous expenses

¹⁹Mohamed Abdel-Raheem Sherif Omran, 1997, pp. 71-3, 106-7.

In subtracting 50 percent of machinery costs, the assumption is made (following Omran, 1997) that the amount subtracted covers those machinery-related expenses that are non-agricultural, including expenses for fuel, most maintenance, and depreciation. Miscellaneous expenses include taxes, charges for canal cleaning, and interest on capital.

The ARI for each crop is calculated first on a per feddan basis. Then the aggregate ARI (AARI) for each crop is calculated by multiplying the ARI by the area under the crop. Then the total aggregate ARI is calculated by summing across all crops. Finally the real AARI is calculated by deflating the AARI by the GDP deflator (1987/88=100).

A weakness of the indicator as calculated is that it does not include tree crops and livestock products. These were omitted for lack of reliable and comprehensive data. Horticultural products and milk products are two sets of products for which output and income may have been growing rapidly in Egypt. The data also omit all production and income on the New Lands, another area where productivity and income are likely to have been growing. These data were also not available. Omitting all of these data probably creates a downward bias in the indicator.

Results and Analysis

In 1997 wheat, cotton, summer rice, summer maize, long and short berseem occupied 79.5% of the cropped area of the crops studied. The total value of these six crops reached LE 20,353 million in 1997, or 72.7% of the total value of crops studied. Summer rice, wheat, long berseem, cotton, summer maize, and sugarcane are the crops that achieved the highest value of those under study; the shares of these six crops were 17.0%, 15.0%, 13.2%, 13.0%, 12.0% and 6%, respectively, or a total of 63.2% of the total value of the crops under study.

Tables 12-1 through 12-6 and Figure 12-1 show the results of the ARI calculations. The trends in these indicators are summarized in Table 12-7. It shows that while the nominal ARI increased for the ten major crops shown therein on a per feddan basis and in the aggregate, the picture was quite different after the nominal ARIs were deflated. None of the ten crops showed an increase in real ARI per feddan. Only rice experienced an increase in real aggregate ARI, clearly because of its dramatic increase in cropped area during 1990-97, when its area increased from 1.0 million feddans to 1.5 million feddans. The aggregate real ARI for all crops studied declined during the period, from an index value of 100 in 1990 to 74 in 1997, although it increased from 1994 to 1996.

The GOE has generally been reducing the amount of intervention into the pricing of farm inputs and outputs. Some of the steps it took during the 1990-97 period include the following. The subsidy on cotton pest control was reduced toward the end of the period; many farmers experienced increases in their land rent when the new law rationalizing land rents went into effect in 1997 (after five years' notice); changes in cotton price policy toward the end of the period raised producer prices in an unsustainable way, but these changes have been adjusted slowly in the following years; the GOE completed the removal of overt fertilizer subsidies early in the period, giving farmers an incentive to conserve this input or use it more efficiently. (Removal of the fertilizer import duty at this time might help to lower fertilizer prices to farmers without any subsidy.) As mentioned above, the results for the real

ARI per feddan indicate more about terms of trade between the agricultural and non-agricultural sectors than it does about the level of farm income.

**Table 12-1: Nominal Agricultural Resource Income Per Feddan for Selected Crops
in the Nile Valley, 1990-1997**

(LE/feddan)

Year	1990	1991	1992	1993	1994	1995	1996	1997
Wheat	1,191	1,131	1,149	1,256	1,217	1,340	1,611	1,670
S. Rice	981	1,185	1,133	1,270	1,625	1,818	2,000	2,098
L. Berseem	874	1,022	1,194	1,346	1,475	1,675	1,998	2,287
Cotton	1,203	1,647	2,472	2,612	1,630	2,770	2,875	2,816
S. Maize	1,027	1,013	959	974	1,047	1,024	1,237	1,436
Sugarcane	1,988	1,775	2,003	2,284	2,733	3,079	3,026	3,367
N. Tomato	4,163	3,993	4,759	4,565	8,283	8,876	6,411	3,090
W. Tomato	2,588	3,666	3,912	2,868	3,442	4,773	5,178	5,177
Sh. Berseem	421	495	600	661	719	818	977	1,119
S. Tomato	1,777	2,142	1,579	4,075	5,132	5,347	5,871	5,851
S. Potato	1,652	1,476	749	2,722	5,540	5,237	2,679	4,013
S. Sorghum	774	533	839	955	790	859	898	1,083
Broad Beans	778	721	381	846	769	1,095	1,210	1,370
N. Maize	686	641	686	681	721	670	791	887
N. Potato	862	1,132	(186)	1,341	2,787	1,361	1,447	2,766
W. Onion (single)	1,159	1,439	1,574	1,159	2,985	1,590	1,456	2,022
Sugarbeets	769	989	850	806	863	1,118	1,014	1,103
R. Berseem	206	221	292	229	242	210	245	250
Peanuts	847	888	804	883	1,186	1,475	1,720	1,985
Sesame	831	978	979	1,008	1,065	1,312	1,413	1,432
Garlic (single)	895	872	1,175	1,284	3,579	2,272	2,766	2,936
Barley	472	486	691	529	682	730	957	985
Soybeans	667	772	592	539	691	698	829	794
Sunflower	634	721	763	662	608	847	839	825

Source: Calculated from MALR data

Egyptian GDP Deflator

1987- 88=100

Years	1990	1991	1992	1993	1994	1995	1996	1997
GDP Deflator	135	154	194	232	255	273	306	345

Source: Ministry of Economy, Egypt 1998

Table 12-2: Real Agricultural Resource Income Per Feddan for Selected Crops in the Nile Valley, 1990-1997

(LE/feddan)

Year	1990	1991	1992	1993	1994	1995	1996	1997
Wheat	883	734	592	541	477	491	526	484
S. Rice	726	770	584	547	637	666	653	608
L. Berseem	647	663	615	580	578	614	653	663
Cotton	891	1,070	1,274	1,126	639	1,015	939	816
S. Maize	761	658	495	420	411	375	404	416
Sugarcane	1,473	1,153	1,032	984	1,072	1,128	989	976
N. Tomato	3,084	2,593	2,453	1,968	3,248	3,251	2,095	896
W. Tomato	1,917	2,380	2,016	1,236	1,350	1,748	1,692	1,501
Sh. Berseem	312	322	309	285	282	300	319	324
S. Tomato	1,316	1,391	814	1,757	2,013	1,959	1,919	1,696
S. Potato	1,224	959	386	1,173	2,172	1,918	875	1,163
S. Sorghum	574	346	432	412	310	315	293	314
Broad Beans	576	468	196	365	302	401	395	397
N. Maize	508	417	354	294	283	245	258	257
N. Potato	639	735	-96	578	1,093	499	473	802
W. Onion (single)	859	935	811	500	1,171	582	476	586
Sugarbeets	570	642	438	347	339	409	331	320
R. Berseem	153	143	151	99	95	77	80	72
Peanuts	628	577	414	381	465	540	562	575
Sesame	615	635	505	434	418	481	462	415
Garlic (single)	663	566	606	554	1,403	832	904	851
Barley	350	316	356	228	267	267	313	286
Soybeans	494	501	305	232	271	256	271	230
Sunflower	469	468	393	285	238	310	274	239

Source: Table 12-1

**Table 12-3: Index of Real Agricultural Resource Income Per Feddan for Selected Crops
in the Nile Valley, 1990-1997**

(1990=100)

Year	1990	1991	1992	1993	1994	1995	1996	1997
Wheat	100	83	67	61	54	56	60	55
S. Rice	100	106	80	75	88	92	90	84
L. Berseem	100	102	95	90	89	95	101	102
Cotton	100	120	143	126	72	114	105	92
S. Maize	100	86	65	55	54	49	53	55
Sugarcane	100	78	70	67	73	77	67	66
N. Tomato	100	84	80	64	105	105	68	29
W. Tomato	100	124	105	64	70	91	88	78
Sh. Berseem	100	103	99	91	90	96	102	104
S. Tomato	100	106	62	133	153	149	146	129
S. Potato	100	78	32	96	178	157	72	95
S. Sorghum	100	60	75	72	54	55	51	55
Broad Beans	100	81	34	63	52	70	69	69
N. Maize	100	82	70	58	56	48	51	51
N. Potato	100	115	-15	90	171	78	74	126
W. Onion (single)	100	109	94	58	136	68	55	68
Sugarbeets	100	113	77	61	59	72	58	56
R. Berseem	100	94	99	65	62	50	52	47
Peanuts	100	92	66	61	74	86	90	92
Sesame	100	103	82	71	68	78	75	67
Garlic (single)	100	85	91	84	212	126	136	128
Barley	100	90	102	65	77	77	89	82
Soybeans	100	101	62	47	55	52	55	47
Sunflower	100	100	84	61	51	66	58	51

Source: Table 12-2

**Table 12-4: Nominal Aggregate Agricultural Resource Income in the Nile Valley
Selected Crops, 1990-1997**

Million L.E.

Year	1990	1991	1992	1993	1994	1995	1996	1997
Wheat	0	0	0	0	0	0	0	0
S. Rice	1,015	1,298	1,370	1,621	2,228	2,521	2,772	3,202
L. Berseem	1,444	1,669	1,980	2,246	2,514	2,825	3,065	3,291
Cotton	1,194	1,402	2,077	2,310	1,176	1,967	2,647	2,420
S. Maize	1,588	1,697	1,576	1,554	1,749	1,712	2,066	2,184
Sugarcane	523	474	542	635	811	920	880	947
N. Tomato	357	283	381	327	569	626	440	196
W. Tomato	392	516	521	372	410	581	867	801
Sh. Berseem	335	357	433	486	529	510	678	768
S. Tomato	210	237	195	364	529	542	655	651
S. Potato	116	119	65	146	288	432	324	265
S. Sorghum	240	167	278	319	285	293	289	378
Broad Beans	267	233	158	213	245	291	357	430
N. Maize	294	251	211	212	224	216	232	256
N. Potato	103	119	-15	72	170	137	120	149
W. Onion (single)	29	41	47	34	65	61	61	62
Sugarbeets	26	49	26	27	30	43	49	62
R. Berseem	34	34	44	33	37	32	35	34
Peanuts	25	26	24	28	39	51	62	68
Sesame	35	56	51	55	46	65	72	60
Garlic (single)	13	15	17	24	43	30	69	47
Barley	41	34	54	33	44	38	46	41
Soybeans	66	78	30	23	37	41	29	24
Sunflower	22	30	40	43	27	52	38	18
Total	10,484	11,378	12,163	13,475	14,208	16,800	19,052	19,836

Source : Calculated from MALR Data

**Table 12-5: Real Aggregate Agricultural Resource Income in the Nile Valley,
for Selected Crops, 1990-1997**

Million L.E.

Year	1990	1991	1992	1993	1994	1995	1996	1997
Wheat	1,567	1,426	1,059	990	829	1,030	1,046	1,009
S. Rice	752	843	706	699	874	924	906	928
L. Berseem	1,070	1,084	1,021	968	986	1,035	1,002	954
Cotton	885	911	1,071	996	461	721	865	701
S. Maize	1,176	1,102	813	670	686	627	675	633
Sugarcane	388	308	280	274	318	337	287	275
N. Tomato	265	184	196	141	223	229	144	57
W. Tomato	290	335	269	160	161	213	283	232
Sh. Berseem	248	232	223	210	208	187	221	223
S. Tomato	155	154	101	157	208	199	214	189
S. Potato	86	77	34	63	113	158	106	77
S. Sorghum	178	108	143	137	112	107	94	110
Broad Beans	197	151	82	92	96	106	117	125
N. Maize	218	163	109	91	88	79	76	74
N. Potato	76	77	-8	31	67	50	39	43
W. Onion (single)	21	26	24	15	26	22	20	18
Sugarbeets	19	32	14	12	12	16	16	18
R. Berseem	25	22	23	14	14	12	11	10
Peanuts	18	17	13	12	15	19	20	20
Sesame	26	36	26	24	18	24	23	17
Garlic (single)	10	9	9	10	17	11	23	14
Barley	30	22	28	14	17	14	15	12
Soybeans	49	50	16	10	14	15	9	7
Sunflower	16	20	20	19	11	19	12	5
Total	7,766	7,388	6,270	5,808	5,572	6,154	6,226	5,750

Source: Table 12-4

**Table 12-6: Index of Real Aggregate Agricultural Resource Income in the Nile Valley,
Selected Crops, 1990-1997**

1990 = 100

Year	1990	1991	1992	1993	1994	1995	1996	1997
Wheat	100.0	91.0	67.6	63.2	52.9	65.8	66.7	64.4
S. Rice	100.0	112.1	93.9	93.0	116.3	122.9	120.5	123.5
L. Berseem	100.0	101.3	95.4	90.5	92.2	96.7	93.6	89.2
Cotton	100.0	102.9	121.0	112.5	52.1	81.5	97.8	79.3
S. Maize	100.0	93.7	69.1	57.0	58.3	53.3	57.4	53.8
Sugarcane	100.0	79.4	72.1	70.7	82.0	86.9	74.2	70.8
N. Tomato	100.0	69.5	74.2	53.3	84.4	86.7	54.3	21.4
W. Tomato	100.0	115.5	92.6	55.3	55.4	73.4	97.6	80.1
Sh. Berseem	100.0	93.3	89.9	84.4	83.7	75.3	89.2	89.7
S. Tomato	100.0	99.0	64.8	101.0	133.5	127.8	137.6	121.4
S. Potato	100.0	89.3	39.0	73.1	131.2	183.5	122.9	89.1
S. Sorghum	100.0	60.9	80.6	77.2	62.9	60.3	53.0	61.6
Broad Beans	100.0	76.5	41.4	46.4	48.6	53.9	59.1	63.1
N. Maize	100.0	74.9	49.9	42.0	40.3	36.3	34.9	34.1
N. Potato	100.0	101.9	-9.9	40.6	87.6	65.8	51.5	56.7
W. Onion (single)	100.0	123.2	113.8	67.8	119.4	103.6	93.7	84.1
Sugarbeets	100.0	163.0	70.0	60.8	60.6	82.0	82.4	92.8
R. Berseem	100.0	88.9	91.6	56.3	57.4	46.9	45.6	39.6
Peanuts	100.0	91.4	68.9	64.9	83.4	102.2	109.9	107.6
Sesame	100.0	139.4	100.9	91.8	68.9	92.0	90.3	66.6
Garlic (single)	100.0	96.4	89.5	105.2	170.8	112.7	230.0	139.8
Barley	100.0	72.9	91.6	46.6	56.6	46.3	49.1	39.6
Soybeans	100.0	103.7	32.3	20.7	29.5	30.9	19.4	14.6
Sunflower	100.0	121.1	125.2	114.0	65.3	116.5	76.4	31.8
Total	100.0	95.1	80.7	74.8	71.7	79.2	80.2	74.0

Source: Table 12-5

Figure 12-1: Nominal Aggregate Agricultural Resource Income

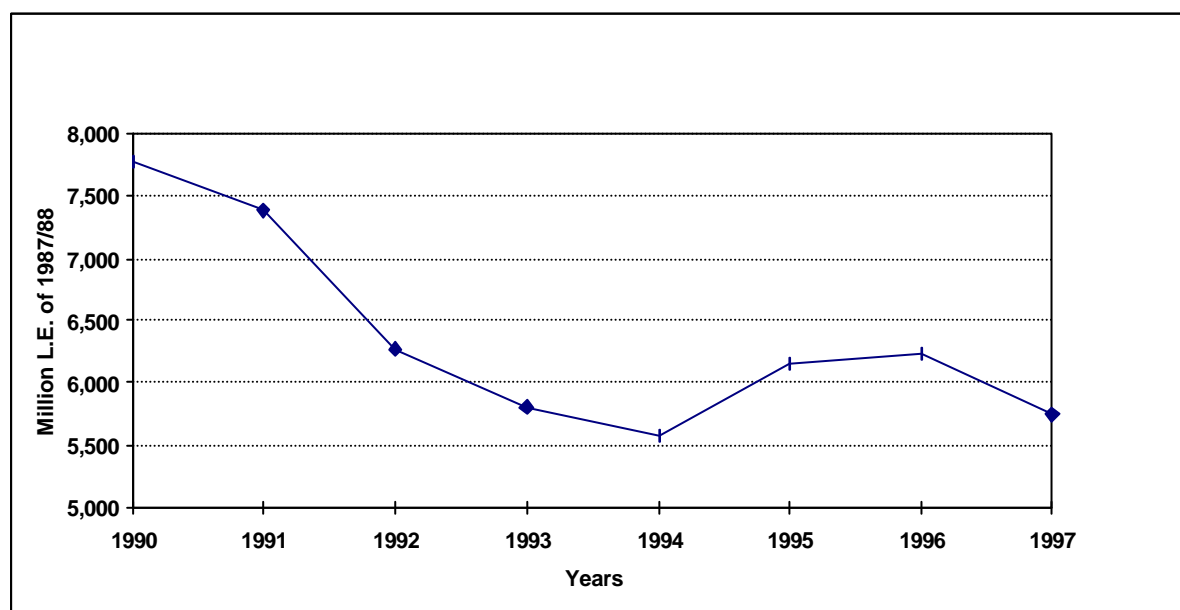
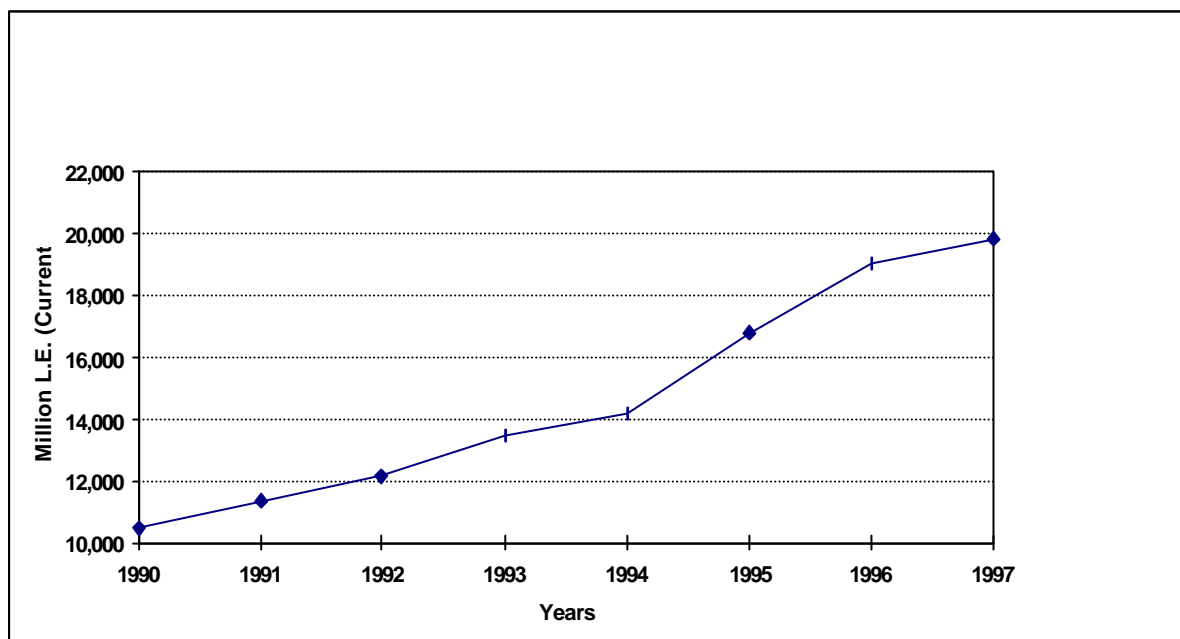


Figure 12-2: Real Aggregate Agricultural Resource Income

Table 12-7: Summary of Changes in ARI of Selected Crops, 1990 to 1997

Crop	Nominal ARI per feddan	Real ARI per feddan	Nominal Aggregate ARI	Real Aggregate ARI	Index of Real Aggregate ARI, 1997 (1990=100)
Wheat	Increase	Decrease	Increase	Decrease	64
Long berseem	Increase	Little change	Increase	Little change	89
Summer rice	Increase	Decrease	Increase	Increase	124
Cotton	Increase	Variable	Increase	Variable	79
Summer maize	Increase	Decrease	Increase	Decrease	54
Sugarcane	Increase	Decrease	Increase	Decrease	71
Winter tomato	Increase	Decrease	Increase	Variable	80
Short berseem	Increase	Little change	Increase	Little change	90
Summer tomato	Increase	Variable	Increase	Variable	121
Total, All Crops Studied			Increase (double)	Decrease	74

Note: Crops are ranked by real aggregate ARI in 1997.

13. CONCLUSIONS AND RECOMMENDATIONS

13.1 Conclusions

13.1.1 Access to Data

The process of collecting and analyzing data to report these indicators leads clearly and directly to the conclusion that access to basic data in Egypt is difficult. MVE was able to find ways to gain access, but the average researcher or market participant would find it much more difficult. This is a serious problem that the GOE needs to work on. A market economy cannot function properly without easy, regular and timely access to accurate information. This point has been made many times before, including in the Unit's assessment of agricultural data (Fawzy et al. 1998).

13.1.2 Suitability of Progress Indicators

The progress indicators for APRP that are included in this report were agreed to by APRP staff after considerable discussion. Nevertheless, during the process of calculating the indicators and analyzing the results, it became clear that not all of the indicators are equally useful in assessing the progress of the program. This is fairly clear from the matrix presented in the executive summary and from the discussions of the indicators in the report, above.

A number of the indicators of progress, particularly those measuring the private sector share of marketing and processing, are very clear indicators of the combined effect of privatization and liberalization. That is, if there were only privatization, but liberalization was inadequate to induce the private sector to enter the market, then the indicator would register at a low level. When the indicator registers a significant presence of the private sector, it is highly likely that the conditions for private sector entry have been attended to reasonably well and that, moreover, the private sector is convinced of the GOE's long-term commitment to private sector activity in this area. Otherwise it is not likely that the private sector would invest in providing such goods or services.

At the other end of the spectrum are indicators that are:

- C Only indirectly or remotely linked to specific reforms (although they may measure ultimate impact), or
- C Complex in themselves and therefore hard to interpret

13.2 Recommendations

13.2.1 Access to Data

The GOE needs "policy champions" in key places (e.g., in each ministry or major organization) to provide leadership and compulsion to a program of making the GOE's data much more available. This would manifest itself in more available data in specific publications and on the Internet, but the

commitment must be made by key individuals. This change of style is part of the reform of government in the market era. If the GOE is truly committed to making the production of private goods and services a market-based process, then it needs to commit as well to the regular and timely provision of accurate information. This is a critical public function that, in general, will not be undertaken by the private sector.

13.2.2 Suitability of Progress Indicators

Before continuing to calculate and publish progress indicators for APRP, the MVE Unit should review the existing indicators in light of the possible defects mentioned above (in section 13.1.2) and make changes to the set of indicators as appropriate.

On *preliminary* review, the following indicators seem *appropriate* for continuation:

- C Real Value of Cotton Lint Exports
- C Real Value of Cotton Yarn Exports
- C Private Sector Share of Distribution of Nitrogenous Fertilizer
- C Private Sector Share of Volume of Seed Cotton Trade
- C Private Sector Share of Volume of Cotton Ginning
- C Private Sector Share of Volume of Cotton Spinning
- C Private Sector Share of Volume of Wheat Milling
- C Private Share of Employment in Cotton Ginning
- C Private Sector Share of Employment of Cotton Spinning
- C Irrigated Area under Water User Associations
- C Volume of Paddy Rice Production per Unit of Water
- C Agricultural Production per Unit of Water

The indicators above bear a direct relationship to specific reforms under way in APRP. Data can be found to measure these indicators and their interpretation is generally straightforward. The last indicator, agricultural production per unit of water, is an exception in that it does not bear a direct relationship to a specific reform. Nevertheless it is a good overall indicator of gains in productive efficiency in the agricultural sector with respect to the key resource, water.

The following indicators seem *not appropriate* for continuation:

- C Nominal Protection Coefficient, Urea
- C Nominal Protection Coefficient, Rice

The NPC is a good diagnostic measure when not much is known about the policy regime in a country. It is also a good indicator of the openness of the trade regime, i.e., the Government's trade-related policies over the long run, for specific commodities. This is particularly true because the Government may be trying to stabilize domestic prices, an effect that should be measured over several years. For these reasons, these NPCs are included in the MVE impact assessment program, where the effects over the duration of APRP can be examined.

The NPC is not a good monitoring tool, however, to track the *annual* impacts of one-time APRP policy reforms like reduction of import tariffs for fertilizer and rice. For this purpose, one could simply determine whether the recommended tariff reductions were made or not. (Besides tariffs, other sources of price distortion in these commodities have either not been identified clearly and/or have not been addressed as policy reforms.) Fluctuations in the NPC do not directly indicate the effects of changes in policies: changes in the NPC in some years reflect only changes in the world price and no change in policy. Thus when the indicator is going up, policy is not necessarily improving, and vice versa.

C Correlation Coefficient between the Monthly Prices of US Pima and Egyptian Cottons

As an answer to the large-country case of Egyptian cotton in the world market, the correlation coefficient is a conceptually reasonable idea. It needs to be implemented in this case, however, with daily data over the short period following the harvest, when the vast majority of the transactions take place. The monthly data available for a long time period do not support the proper level of analysis. Thus, the most useful part of the results presented above may be the graphs of price trends.

C Real Value of RMG Exports

APRP is not working directly in the area of RMG exports. Some policies to be reformed under APRP may have an impact on RMG exports, but these impacts will be indirect and difficult to attribute to specific reforms. The world textile quota system and the way in which Egypt participates in it probably affect the level of this indicator more than APRP policy reforms. The success of RMG exports is also in large part attributable to a duty drawback system on cheap imported short-staple cotton. The fact that many RMG companies are located in areas where they receive long tax holidays also enhances their competitiveness. The increase in RMG exports has been driven by policy exceptions and world market idiosyncracies, not by policy changes under APRP. A more relevant indicator of APRP success for RMG production might be the proportion of raw material (yarn and fabric) coming from Egyptian lint cotton.

C Ratio of Earnings Of Non-Banking Activities To Total Earnings, PBDAC

While the development of PBDAC as a banking institution is a critical issue for the agricultural sector in Egypt, APRP is not devoting itself to this objective.

C Agricultural Resource Income

This indicator measures to some extent the welfare of farmers, but this is also one of the important objectives of the MVE Unit's impact assessment program. The indicator also measures to some extent the terms of trade facing the agricultural sector, which is not the intention of the indicator in this use. Moreover, the indicator mixes together the farmer's welfare and the sectoral terms of trade without a clear way to separate the effects. The indicator does not bear a direct relationship to any specific reform under way in APRP.

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ANNEXES

**ANNEX A: FIRST FULL FISCAL YEAR OF PRIVATE OPERATION,
PRIVATIZED TEXTILE AFFILIATED COMPANIES**

Ginning companies		Spinning companies	
Arabeya	1996/97	KABO	1997/98
Nile	1997/98	Alexandria S&W	1998/99
		Unirab	1997/98
		Esco (one unit only)	1998/99

Notes:

KABO: stock sales as of June 1997 so that 93% private, 7% ESOP. Consider operated as private company in 1997/98 or CY 1998. During 1997/98, KABO group gained a controlling share of firm.

Alexandria S&W: 45.6% private in mid-April 1997; > 50% in GOE FY 1997/98; became Law 159 in March, 1998. Consider operated as private company in 1998/99 or CY 1998.

Unirab: 63% private as of May 1997. Shares sold in December 1996. 5 May 1997 - change from Law 203 to a Law 159 company. HC share in June 1997 still 33.4%. Consider operated as private company in 1997/98 or CY 1998.

Esco: Dong-Il leased one of six units for use as a spinning facility; the other five units of the company have been leased, mostly for non-textile purposes. Cairo Silk unit does dyeing, finishing, weaving, not spinning or ginning. Dong-Il's operations began in August, 1998.

Arabeya and Nile Ginning Companies: Both former public ginning companies were privatized in 1996/97. Arab Ginning was privatized early in the marketing season (October?), so MVE considers that it operated as a privately owned and managed gin during the entire year. Nile Ginning was privatized in early 1997 (February?), after most of the ginning had been completed. Hence, MVE considers that Nile Ginning operated as private company as of 1997/98.

Ahly, Nefertiti, and Modern Nile: negotiated leases to manage and operate some gins at several of the public ginning companies. Ahly and Nefertiti negotiated five year leases, though Ahly canceled its leases by the end of 1997/98. Nefertiti leased one gin from Nile Ginning in Minya from 1994/95 to 1998/99; Nile was publicly owned during the first three years and privately owned during the final two years. Modern Nile only leased gins for two years; once the Modern Nile Group bought Arabeya Ginning, it dropped its ginning leases.

Egypt (Baraka) Company built a gin (using second-hand U.S. equipment and rotary knife technology) on the Alex desert road. This gin was sold to Arab Ginning by 1998/99 and operated as a pressing and export staging facility by the Modern Nile Group. Nefertiti bought one of Arabeya Ginning's gins on the west bank of El Minya and operated this as a private gin as of 1998/99.

ANNEX B: ADDITIONAL DATA

Table B1a-1: Nominal Protection Coefficient for Urea, Import Parity, 1990 to 1997

Items	Unit	1990	1991	1992	1993	1994	1995	1996	1997
Urea									
World Price E.Europe (Urea 46%)* ⁽¹⁾	\$/Ton	109.9	132.7	117.5	85.5	98.1	191.2	176.9	117.5
Freight** ⁽²⁾	\$/Ton	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
World Price at Alex ⁽³⁾	\$/Ton	124.9	147.7	132.5	100.5	113.1	206.2	191.9	132.5
Exchange Rate*** ⁽⁴⁾	L.E./\$	2.0	3.3	3.3	3.4	3.4	3.4	3.4	3.4
World Price Equivalent at Alex ⁽⁵⁾	L.E./Ton	249.9	491.9	442.5	338.8	383.4	699.2	650.5	449.1
Transportation from port to Mansoura ⁽⁶⁾	L.E./Ton	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
World Price Equivalent at Mansoura ⁽⁷⁾	L.E./Ton	234.9	476.9	427.5	323.8	368.4	684.2	635.5	434.1
Cost of bagging ⁽⁸⁾	L.E./Ton	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
World Price Equivalent at Warehouse (Urea 46%) ⁽⁹⁾	L.E./Ton	242.9	484.9	435.5	331.8	376.4	692.2	643.5	442.1
Ex-factory Price (Abu-Kir)**** ⁽¹⁰⁾	L.E./Ton		280.0	420.0	450.0	442.0	442.0	495.0	495.0
Transportation from the Abu-kir to the Warehouse ⁽¹¹⁾	L.E./Ton		15.0	15.0	15.0	15.0	15.0	15.0	15.0
Ex-factory Price (Talka)**** ⁽¹²⁾	L.E./Ton		251.0	400.0	441.0	431.0	433.0	441.0	495.0
Transportation from Talka to the Warehouse ⁽¹³⁾	L.E./Ton		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production of Urea 46% at Talka**** ⁽¹⁴⁾	000 MT		460.1	370.6	338.1	393.3	394.7	508.8	541.7
Production of Urea 46% at Abu Kir**** ⁽¹⁵⁾	000 MT		463.9	503.3	498.0	537.3	522.0	537.9	522.0
Domestic Price ⁽¹⁶⁾	L.E./Ton		273.1	420.2	455.3	446.0	446.7	476.5	502.4
NPC ⁽¹⁷⁾			0.56	0.96	1.37	1.19	0.65	0.74	1.14

Source: * Green Market

** Personal Communication, Mr. Saad Hagrass office "Fertilizer Trader" Department of Agricultural Economics, Faculty of Agricultural, Suez Canal University, 1997

*** International Monetary Fund International Financial Statistical Yearbook 1997

**** Holding Company for Chemical Industries

Notes on calculations: 3=2+1, 5=4*3, 7=5-6, 9=7+8, 16=(14)(12+13)+(15)(10+11)/(14+15), 17=16/9

Table B1a-2: Nominal Protection Coefficient for Urea, Export Parity, 1990 to 1997

Items	Units	1990	1991	1992	1993	1994	1995	1996	1997
Urea									
Production of Urea 46% at Talka* ⁽¹⁾	000 MT		460.1	370.6	338.1	393.3	394.7	508.8	541.7
Ex-factory price of Urea 46% (Talka)* ⁽²⁾	L.E. /Ton		251	400	441	431	433	441	495
Transportation from Talka to Alexandria ⁽³⁾	L.E. /Ton		15	15	15	15	15	15	15
Production of Urea 46% at Abu Kir* ⁽⁴⁾	000 MT		463.9	503.3	498	537.3	522	537.9	522
Ex-factory price of Urea 46% (Abu Kir)* ⁽⁵⁾	L.E. /Ton		280	420	450	442	442	495	495
Transportation from Abu Kir to Alexandria ⁽⁶⁾	L.E. /Ton		0	0	0	0	0	0	0
Price at Alexandria for Urea ⁽⁷⁾	L.E. /Ton		273.0288	417.88	452.426	443.691	444.583	476.042	502.6389
Exchange Rate*** ⁽⁸⁾	\$ / L.E.	2	3.33	3.34	3.37	3.39	3.39	3.39	3.39
f.o.b. Price for Urea in \$ at Alex ⁽⁹⁾	\$ / Ton		81.99063	125.114	134.251	130.882	131.146	140.425	148.2711
Fright ⁽¹⁰⁾	\$ / Ton		15	15	15	15	15	15	15
c.i.f. Prices for Urea from Egypt in W. Europe ⁽¹¹⁾	\$ / Ton		96.99063	140.114	149.251	145.882	146.146	155.425	163.2711
Urea f.o.b. Price W. Europe***** ⁽¹²⁾	\$ / Ton	157	172	140.33	106.75	147.92	211.5	205.48	146.1
Freight cost ⁽¹³⁾	\$ / Ton	15	15	15	15	15	15	15	15
World Price at W. Europe c.i.f. ⁽¹⁴⁾	\$ / Ton	172	187	155.33	121.75	162.92	226.5	220.48	161.1
NPC ⁽¹⁵⁾			0.518666	0.90204	1.22588	0.89542	0.64523	0.70494	1.013476

Source: * Holding Company for Chemical Industries

** Personal Communication Mr. Saad Hagrass office "Fertilizer Trader"

*** International Monetary Fund International Financial Statistical Yearbook,1997

***** Green Market

Notes on Calculation: 7=(((1)(2+3))+(4)(5+6))/(1+4) , 9=7/8 ,11=9+10 ,14=12+13, 15=11/14

**Table B2-1: Monthly Prices of Egyptian and US Cotton, CIF North Europe,
September 1989 to August 1998**
(US c/lb)

Month	US Pima	Giza 75	Giza 77	Giza 70
Sep- 89	120.75	197.75	257.50	246.55
Oct- 89	119.25	200.25	260.70	246.55
Nov- 89	116.60	202.75	263.95	249.19
Dec- 89	115.67	188.30	248.30	257.10
Jan- 90	110.75	188.30	248.30	257.38
Feb- 90	105.00	188.30	248.30	257.75
Mar- 90	105.00	188.30	248.30	257.75
Apr- 90	105.00	188.30	248.30	257.75
May- 90	105.00	189.50	249.85	257.75
Jun- 90	104.75	191.85	252.95	257.75
Jul- 90	NA	193.00	254.20	258.13
Aug- 90	127.8	194.2	255.8	259.25
Sep- 90	132.75	194.20	255.80	259.25
Oct- 90	135.75	194.20	255.80	259.25
Nov- 90	137.40	176.75	239.75	244.75
Dec- 90	138.00	176.75	239.75	244.75
Jan- 91	137.00	176.79	239.87	244.95
Feb- 91	138.00	176.80	239.90	245.00
Mar- 91	138.00	176.80	239.90	245.00
Apr- 91	138.00	176.80	239.90	245.00
May- 91	138.00	176.80	239.90	245.00
Jun- 91	138.00	176.80	239.90	245.00
Jul- 91	137.75	176.80	239.90	245.00
Aug- 91	NA	NA	NA	NA
Sep- 91	NA	NA	NA	NA
Oct- 91	NA	NA	NA	NA
Nov- 91	NA	NA	NA	NA
Dec- 91	NA	NA	NA	NA
Jan- 92	NA	NA	NA	NA
Feb- 92	NA	NA	NA	NA
Mar- 92	NA	NA	NA	NA
Apr- 92	NA	NA	NA	NA
May- 92	NA	NA	NA	NA
Jun- 92	NA	NA	NA	NA
Jul- 92	NA	NA	NA	NA
Aug- 92	NA	NA	NA	NA
Sep- 92	NA	NA	NA	NA
Oct- 92	NA	NA	NA	NA

Month	US Pima	Giza 75	Giza 77	Giza 70
Nov- 92	NA	NA	NA	NA
Dec- 92	NA	NA	NA	NA
Jan- 93	NA	NA	NA	NA
Feb- 93	NA	NA	NA	NA
Mar- 93	NA	NA	NA	NA
Apr- 93	NA	NA	NA	NA
May- 93	NA	NA	NA	NA
Jun- 93	NA	NA	NA	NA
Jul- 93	NA	NA	NA	NA
Aug- 93	100.00	100.25	No Exp.	135.55
Sep- 93	99.52	98.13	No Exp.	129.50
Oct- 93	97.14	91.75	No Exp.	112.25
Nov- 93	96.05	91.75	No Exp.	112.25
Dec- 93	96.00	91.75	No Exp.	112.25
Jan- 94	99.70	91.75	No Exp.	112.25
Feb- 94	104.75	90.13	No Exp.	110.63
Mar- 94	106.77	88.50	No Exp.	109.00
Apr- 94	107.00	88.50	No Exp.	109.00
May- 94	107.00	88.50	No Exp.	109.00
Jun- 94	110.00	88.50	No Exp.	109.00
Jul- 94	111.68	88.50	No Exp.	109.00
Aug- 94	114.29	88.50	98.75	109.00
Sep- 94	116.67	93.00	101.95	110.20
Oct- 94	116.00	99.75	106.75	112.00
Nov- 94	116.86	99.75	106.75	112.00
Dec- 94	121.15	99.75	106.75	112.00
Jan- 95	125.43	No Exp.	No Exp.	No Exp.
Feb- 95	127.60	No Exp.	No Exp.	No Exp.
Mar- 95	137.87	No Exp.	No Exp.	No Exp.
Apr- 95	142.56	No Exp.	No Exp.	No Exp.
May- 95	145.76	No Exp.	No Exp.	No Exp.
Jun- 95	147.36	No Exp.	No Exp.	No Exp.
Jul- 95	150.00	No Exp.	No Exp.	No Exp.
Aug- 95	151.95	No Exp.	No Exp.	No Exp.
Sep- 95	156.19	No Exp.	No Exp.	No Exp.
Oct- 95	163.09	No Exp.	No Exp.	No Exp.
Nov- 95	177.27	No Exp.	No Exp.	No Exp.
Dec- 95	184.8	No Exp.	No Exp.	No Exp.
Jan- 96	182.55	No Exp.	No Exp.	No Exp.
Feb- 96	178	No Exp.	190.00	195.25
Mar- 96	178.00	No Exp.	190.00	195.25

Month	US Pima	Giza 75	Giza 77	Giza 70
Apr- 96	178.00	No Exp.	190.00	195.25
May- 96	174.76	No Exp.	190.00	195.25
Jun- 96	164.15	No Exp.	190.00	195.25
Jul- 96	154.65	No Exp.	190.00	195.25
Aug- 96	117.57	No Exp.	190.00	195.25
Sep- 96	115.19	114.75	140.25	145.50
Oct- 96	110.24	114.75	140.50	145.50
Nov- 96	113.38	114.75	142.50	145.50
Dec- 96	124.55	117.08	144.17	148.83
Jan- 97	126.23	122.75	149.50	154.50
Feb- 97	129.15	122.75	150.00	155
Mar- 97	132	122.75	150.50	155.50
Apr- 97	131.00	122.75	150.50	155.50
May- 97	130	122.75	150.50	155.50
Jun- 97	123.90	122.75	150.50	155.50
Jul- 97	120.00	122.75	150.50	155.50
Aug- 97	112.00	122.75	150.50	155.50
Sep- 97	112.00	104.00	126.50	134.75
Oct- 97	112.09	104.00	126.50	134.75
Nov- 97	115.80	104.00	126.50	134.75
Dec- 97	116.48	104.00	126.50	134.75
Jan- 98	115.52	104.00	126.50	134.75
Feb- 98	113.35	104.00	126.50	134.75
Mar- 98	113.88	104.00	126.50	134.75
Apr- 98	118.20	104.00	126.50	134.75
May- 98	118.37	104.00	126.50	134.75
Jun- 98	119.00	104.00	126.50	134.75
Jul- 98	119.00	104.00	126.50	134.75
Aug- 98	NA	104	126.5	134.75

Sources: ICAC (International Cotton Advisory Committee), October 1996; ALCOTEXA: Alexandria Cotton Exporters' Association Information Center (Courtesy of Cotlook limited).

Note : No Exp. = No exports
NA = Not available

**Table B2-2: Monthly Prices of Egyptian Cottons (FOB Alexandria) and US Pima
(CIF N. Europe), 1996-1998**
(US c/lb)

Month	US Pima (Grade 3)	Giza 86 (G/FG)	Giza 75 (G/FG)	Giza 77 (G/FG)	Giza 70 (G/FG)
Sep. 96	115.20	111.00	110.00	135.00	140
Oct. 96	110.20	113.50	110.00	135.00	140
Nov. 96	113.40	119.60	110.00	137.00	140
Dec. 96	124.60		112.30	138.70	142.7
Jan. 97	126.20	122.60	117.60	143.60	148.6
Feb. 97	129.20	123.00	118.00	144.30	149.3
Mar.97	132.00	123.00	118.00	145.00	150
Apr. 97	131.00	123.00	118.00	145.00	150
May 97	140.00	123.00	118.00	145.00	150
June 97	123.90	123.00	118.00	145.00	150
July 97	120.00	123.00	118.00	145.00	150
Aug. 97	112.00	123.00	118.00	145.00	150
Sep. 97	112	108	100	122	130
Oct. 97	112.10	108.00	100.00	122.00	130
Nov. 97	115.80	108.00	100.00	122.00	130
Dec. 97	116.50	109.00	100.00	122.00	130
Jan. 98	115.50	109.00	100.00	122.00	130
Feb. 98	113.40	109.00	100.00	122.00	130
Mar. 98	113.90	109.00	100.00	122.00	130
Apr. 98	118.20	109.00	100.00	122.00	130
May. 98	118.40	107.20	100.00	122.00	130
Jun. 98	119.00	106.00	100.00	122.00	130
Jul. 98	119.00	106.00	100.00	122.00	130

Sources: ALCOTEXA (Egyptian export prices); Cotton Outlook (Pima prices)

Table B2-3: Weekly Egyptian and US Export Prices, by Variety, 1996-1997
(US c/lb)

Week Beginning	US Pima (Grade 3)	Giza 86 (Grade G/FG)	Giza 75 (Grade G/FG)	Giza 77 (Grade G/FG)	Giza 70 (Grade G/FG)
Sep. 15	117	111	110	135	140
Sep. 22	115	111	110	135	140
Sep. 28	113	112	110	135	140
Oct. 06	111	112	110	135	140
Oct. 13	111	115	110	135	140
Oct. 20	111	118	110	136	140
Oct. 27	109	120	110	136	140
Nov. 03	109	120	110	137	140
Nov. 10	110	120	110	137	140
Nov. 17	113	120	110	137	140
Nov. 24	116	120	110	137	140
Dec. 01	118	120	110	138	142
Dec. 08	121	120	112	140	143
Dec. 15	124	120	115	142	145
Dec. 22	127	123	116	144	147
Dec. 29	127	123	118	144	149
Jan. 05	127	123	118	144	149
Jan. 12	126	123	118	144	149
Jan. 19	126	123	118	144	149
Jan. 26	126	123	118	144	149
Feb. 02	126	123	118	144	149
Feb. 09	129	123	118	144	149
Feb. 16	129	123	118	145	150
Feb. 23	129	123	118	145	150
Mar. 02	130	123	118	145	150
Mar. 09	132	123	118	145	150
Mar. 16	132	123	118	145	150
Mar. 23	132	123	118	145	150
Mar. 30	131	123	118	145	150
Apr. 06	131	123	118	145	150
Apr. 13	131	123	118	145	150

Sources: ALCOTEXA (for Egyptian export prices); Krenz, 1997 (for US Pima prices)

Table B5a-1: Private Companies Participating in Seed Cotton Trading, 1994/95 to 1998/99

Company	1994/95	1995/96	1996/97	1997/98	1998/99
Ahly (National)	X	X			
Egypt Comp.	X	X			
Nefertity	X	X			X
Modern Nile		X		X	X
El-Mabrok		X			X
T. Harb		X			
Sodasia		X			
Alacon		X			
Kantoush		X			
El-Watany		X			X
Mostafa		X			
Arabia Ginning		X		X	X
Arab Trade and Investment				X	X
Nile Ginning					X
Nassco					X
El-Attar					X
Tanta cotton Trading					X
Other		X			
Total	3	12	0	3	10

Source: Cotton and International Trade Holding Company

Table B5c-1: Number of Non-Traditional Private Spinning Companies, 1990/91 to 1998/99

Year	New Investments	Privatized Companies	Total
1990/91	5	0	5
1991/92	5	0	5
1992/93	5	0	5
1993/94	6	0	6
1994/95	6	0	6
1995/96	6	0	6
1996/97	7	0	7
1997/98	9	1	10
1998/99	14	4	18

Source: MVE Cotton Spinners Survey, 1999

Table B10-1: Area, Yield and Production of Summer Rice by Variety, 1990 to 1997

Summer Rice		Total			Giza 171			Giza 172			Giza 175		
		Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons
1990	Total Valley	1,034,830	3.06	3,162,642	486,192	3.03	1,472,826	294,029	2.63	771,906	57,856	3.48	201,294
	Desert & New Land	1,515	2.30	3,485	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	1,036,345	3.06	3,166,126	486,192	3.03	1,472,826	294,029	2.63	771,906	57,856	3.48	201,294
1991	Total Valley	1,094,608	3.14	3,437,478	530,646	3.08	1,633,613	218,538	2.76	603,642	42,178	3.44	145,113
	Desert & New Land	5,051	1.80	9,092	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	1,099,659	3.13	3,446,570	530,646	3.08	1,633,613	218,538	2.76	603,642	42,178	3.44	145,113
1992	Total Valley	1,209,141	3.22	3,897,926	595,314	3.14	1,870,710	180,780	2.98	538,432	31,399	3.52	110,555
	Desert & New Land	5,386	1.93	10,408	5,386	1.93	10,408	0	0.00	0	0	0.00	0
	Total Egypt	1,214,527	3.22	3,908,334	600,700	3.13	1,881,118	180,780	2.98	538,432	31,399	3.52	110,555
1993	Total Valley	1,276,295	3.25	4,147,613	615,741	3.13	1,926,701	137,170	2.98	408,134	30,210	3.37	101,948
	Desert & New Land	5,495	2.10	11,522	5,495	2.10	11,522	0	0.00	0	0	0.00	0
	Total Egypt	1,281,790	3.24	4,159,135	621,236	3.12	1,938,223	137,170	2.98	408,134	30,210	3.37	101,948
1994	Total Valley	1,371,017	3.33	4,566,681	691,263	3.23	2,231,059	165,598	3.14	519,849	38,903	3.44	133,643
	Desert & New Land	6,693	2.27	15,220	6,693	2.27	15,220	0	0.00	0	0	0.00	0
	Total Egypt	1,377,710	3.33	4,581,901	697,956	3.22	2,246,279	165,598	3.14	519,849	38,903	3.44	133,643
1995	Total Valley	1,386,449	3.43	4,755,220	750,438	3.42	2,565,773	150,587	3.27	492,216	24,015	3.64	87,466
	Desert & New Land	13,571	2.42	32,878	1,271	2.22	2,826	2,375	1.58	3,743	140	2.60	364
	Total Egypt	1,400,020	3.42	4,788,098	751,709	3.42	2,568,599	152,962	3.24	495,959	24,155	3.64	87,830
1996	Total Valley	1,386,198	3.49	4,843,685	709,875	3.45	2,448,591	85,726	3.26	279,477	9,403	3.59	33,762
	Desert & New Land	19,070	2.71	51,703	6,566	2.65	17,388	900	2.75	2,475	774	2.00	1,546
	Total Egypt	1,405,268	3.48	4,895,388	716,441	3.44	2,465,979	86,626	3.25	281,952	10,177	3.47	35,308
1997	Total Valley	1,525,756	3.55	5,412,448	742,001	3.51	2,607,743	98,529	3.30	325,063	919	3.35	3,081
	Desert & New Land	24,116	2.80	67,562	8,951	2.43	21,795	296	2.66	788	45	3.00	135
	Total Egypt	1,549,872	3.54	5,480,010	750,952	3.50	2,629,538	98,825	3.30	325,851	964	3.34	3,216

Source : Department for Agricultural Economics Affairs , MALR

Table B10-1: Area, Yield and Production of Summer Rice by Variety, 1990 to 1997

Summer Rice		Giza 176			Giza 181			IR 28			Reho (Giza 173)		
		Area	Yield	Production	Area	Yield	Production	Area	Yield	Production	Area	Yield	Production
		Feddan	Tons / Fed.	Tons	Feddan	Tons / Fed.	Tons	Feddan	Tons / Fed.	Tons	Feddan	Tons / Fed.	Tons
1990	Total Valley	59,197	3.61	213,638	45,949	3.85	176,699	73,407	3.72	273,091	11,876	2.89	34,283
	Desert & New	0	0	0	0	0	0	0	0	0	0	0	0
	Total Egypt	59,197	3.61	213,638	45,949	3.85	176,699	73,407	3.72	273,091	11,876	2.89	34,283
1991	Total Valley	211,348	3.46	732,029	42,422	3.42	145,282	18,586	4.21	78,317	23,603	3.23	76,312
	Desert & New	0	0	0	0	0	0	0	0	0	0	0	0
	Total Egypt	211,348	3.46	732,029	42,422	3.42	145,282	18,586	4.21	78,317	23,603	3.23	76,312
1992	Total Valley	310,082	3.39	1,052,653	43,082	3.60	154,894	18,755	4.11	77,159	15,369	3.13	48,031
	Desert & New	0	0	0	0	0	0	0	0	0	0	0	0
	Total Egypt	310,082	3.39	1,052,653	43,082	3.60	154,894	18,755	4.11	77,159	15,369	3.13	48,031
1993	Total Valley	398,969	3.45	1,376,227	37,857	3.55	134,218	26,909	4.21	113,402	27,820	2.93	81,545
	Desert & New	0	0	0	0	0	0	0	0	0	0	0	0
	Total Egypt	398,969	3.45	1,376,227	37,857	3.55	134,218	26,909	4.21	113,402	27,820	2.93	81,545
1994	Total Valley	429,062	3.53	1,515,078	8,499	4.01	34,076	681	3.44	2,341	35,572	3.53	125,537
	Desert & New	0	0	0	0	0	0	0	0	0	0	0	0
	Total Egypt	429,062	3.53	1,515,078	8,499	4.01	34,076	681	3.44	2,341	35,572	3.53	125,537
1995	Total Valley	377,535	3.54	1,334,955	6,600	3.98	26,256	16	3.88	62	39,652	3.17	125,879
	Desert & New	8,526	2.66	22,689	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	386,061	3.52	1,357,644	6,600	3.98	26,256	16	3.88	62	39,652	3.17	125,879
1996	Total Valley	264,432	3.42	903,830	4,696	4.03	18,929	0	0.00	0	51,180	3.35	171,680
	Desert & New	8,164	2.88	23,500	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	272,596	3.40	927,330	4,696	4.03	18,929	0	0.00	0	51,180	3.35	171,680
1997	Total Valley	159,424	3.38	538,901	1,866	4.09	7,634	652	4.42	2,884	55,562	3.43	190,708
	Desert & New	11,852	3.11	36,807	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	171,276	3	575,708.00	1,866	4	7634.00	652	4.42	2,884.00	55,562	3.43	190,708

Source : Department for Agricultural Economics Affairs , MALR

Table B10-1: Area, Yield and Production of Summer Rice by Variety, 1990 to 1997

Summer Rice	Giza 178			Giza 177			Other		
	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons
1990									
Total Valley	0	0.00	0	0	0.00	0	6,324	2.99	18,905
Desert & New Land	0	0.00	0	0	0.00	0	1,515	2.30	3,485
Total Egypt	0	0.00	0	0	0.00	0	7,839	2.86	22,390
1991									
Total Valley	0	0.00	0	0	0.00	0	7,287	3.18	23,170
Desert & New Land	0	0.00	0	0	0.00	0	5,051	1.80	9,092
Total Egypt	0	0.00	0	0	0.00	0	12,338	2.61	32,262
1992									
Total Valley	0	0.00	0	0	0.00	0	14,360	3.17	45,492
Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0
Total Egypt	0	0.00	0	0	0.00	0	14,360	3.17	45,492
1993									
Total Valley	0	0.00	0	0	0.00	0	1,619	3.36	5,438
Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0
Total Egypt	0	0.00	0	0	0.00	0	1,619	3.36	5,438
1994									
Total Valley	0	0.00	0	0	0.00	0	1,439	3.54	5,098
Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0
Total Egypt	0	0.00	0	0	0.00	0	1,439	3.54	5,098
1995									
Total Valley	3,670	3.68	13,519	23,742	3.41	80,889	10,194	2.77	28,205
Desert & New Land	0	0.00	0	0	0.00	0	1,259	5.59	3,256
Total Egypt	3,670	3.68	13,519	23,742	3.41	80,889	11,453	2.75	31,461
1996									
Total Valley	126,570	4.12	521,580	134,069	3.47	465,044	247	3.21	792
Desert & New Land	0	0.00	0	0	0.00	0	2,666	2.55	6,794
Total Egypt	126,570	4.12	521,580	134,069	3.47	465,044	2,913	2.60	7,586
1997									
Total Valley	294,149	3.82	1,123,050	167,939	3.55	596,649	4,715	3.55	16,735
Desert & New Land	1,430	3.13	4,477	317	2.43	769	1,225	2.28	2,791
Total Egypt	295,579	3.81	1,127,527	168,256	3.55	597,418	5,940	3.29	19,526

Source : Department for Agricultural Economics Affairs , MALR

Table B10-2: Area Under Rice, by Variety (Shares), 1997

Varieties	Days to Maturity	Share (Percent)	Weighted Share (Percent)
G.171	155	48.45	75.10
G.172	155	6.38	9.88
G.175	125	0.06	0.08
G.176	145	11.05	16.02
G.181	145	0.12	0.17
IR 28	125	0.04	0.05
G.173	155	3.58	5.56
G.178	135	19.07	25.75
G.177	125	10.86	13.57
Weighted Average Days to Maturity			146.19

Source: Tables B10-1 and B10-3

Table B10-3a: Consumptive Use of Water, Giza 171 Rice, 1990 to 1997

Years	Area (Feddans)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive Use of Water (m³/Fed.)	Amount of Water per Feddan per Day	Total Amount of Water (b cm)
1990	486,192	155	10	145	4714	32.51	2,291,909,088
1991	530,646	155	10	145	4714	32.51	2,501,465,244
1992	600,700	155	10	145	4714	32.51	2,831,699,800
1993	621,236	155	10	145	4714	32.51	2,928,506,504
1994	697,956	155	10	145	4714	32.51	3,290,164,584
1995	751,709	155	10	145	4714	32.51	3,543,556,226
1996	716,441	155	10	145	4714	32.51	3,377,302,874
1997	750,952	155	10	145	4714	32.51	3,539,987,728

Source: Table B10-1 & MALR

Table B10-3b: Consumptive Use of Water, Giza 172 Rice, 1990 to 1997

Years	Area (Feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Feddan per Day	Total Amount of Water m³
1990	294,029	155	10	145	4714	32.51	1,386,052,706
1991	218,538	155	10	145	4714	32.51	1,030,188,132
1992	180,780	155	10	145	4714	32.51	852,196,920
1993	137,170	155	10	145	4714	32.51	646,619,380
1994	165,598	155	10	145	4714	32.51	780,628,972
1995	152,962	155	10	145	4714	32.51	721,062,868
1996	86,626	155	10	145	4714	32.51	408,354,964
1997	98,825	155	10	145	4714	32.51	465,861,050

Source: Table B10-1 & MALR

Table B10-3c: Consumptive Use of Water, Giza 175 Rice, 1990 to 1997

Years	Area (Feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Feddan Per Day	Total Amount of Water m³
1990	57,856	125	10	115	4714	40.99	272,733,184
1991	42,178	125	10	115	4714	40.99	198,827,092
1992	31,399	125	10	115	4714	40.99	148,014,886
1993	30,210	125	10	115	4714	40.99	142,409,940
1994	38,903	125	10	115	4714	40.99	183,388,742
1995	24,155	125	10	115	4714	40.99	113,866,670
1996	10,177	125	10	115	4714	40.99	47,974,378
1997	964	125	10	115	4714	40.99	4,544,296

Source: Table B10-1 & MALR

Table B10-3d: Consumptive Use of Water, Giza 176 Rice, 1990 to 1997

Years	Area (Feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Feddan per Day	Total Amount of Water m³
1990	59,197	145	10	135	4714	34.92	279,054,658
1991	211,348	145	10	135	4714	34.92	996,294,472
1992	310,082	145	10	135	4714	34.92	1,461,726,548
1993	398,969	145	10	135	4714	34.92	1,880,739,866
1994	429,062	145	10	135	4714	34.92	2,022,598,268
1995	386,061	145	10	135	4714	34.92	1,819,891,554
1996	272,596	145	10	135	4714	34.92	1,285,017,544
1997	171,276	145	10	135	4714	34.92	807,395,064

Source: Table B10-1 & MALR

Table B10-3e: Consumptive Use of Water, Giza 181 Rice, 1990 to 1997

Years	Area (feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Feddan per Day	Total Amount of Water m³
1990	45,949	145	10	135	4714	34.92	216,603,586
1991	42,422	145	10	135	4714	34.92	199,977,308
1992	43,082	145	10	135	4714	34.92	203,088,548
1993	37,857	145	10	135	4714	34.92	178,457,898
1994	8,499	145	10	135	4714	34.92	40,064,286
1995	6,600	145	10	135	4714	34.92	31,112,400
1996	4,696	145	10	135	4714	34.92	22,136,944
1997	1,866	145	10	135	4714	34.92	8,796,324

Source: Table B10-1 & MALR

Table B10-3f: Consumptive Use of Water, Philipien Rice, 1990 to 1997

Years	Area (Feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Feddan per Day	Total Amount of Water m³
1990	73,407	125	10	115	4714	40.99	346,040,598
1991	18,586	125	10	115	4714	40.99	87,614,404
1992	18,755	125	10	115	4714	40.99	88,411,070
1993	26,909	125	10	115	4714	40.99	126,849,026
1994	681	125	10	115	4714	40.99	3,210,234
1995	16	125	10	115	4714	40.99	75,424
1996	0	125	10	115	4714	40.99	0
1997	652	125	10	115	4714	40.99	3,073,528

Source: Table B10-1 & MALR

Table B10-3g: Consumptive Use of Water, Giza 173 Rice, 1990 to 1997

Years	Area (Feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Fed. per Day	Total Amount of Water m³
1990	11,876	155	10	145	4714	32.51	55,983,464
1991	23,603	155	10	145	4714	32.51	111,264,542
1992	15,369	155	10	145	4714	32.51	72,449,466
1993	27,820	155	10	145	4714	32.51	131,143,480
1994	35,572	155	10	145	4714	32.51	167,686,408
1995	39,652	155	10	145	4714	32.51	186,919,528
1996	51,180	155	10	145	4714	32.51	241,262,520
1997	55,562	155	10	145	4714	32.51	261,919,268

Source: Table B10-1 & MALR

Table B10-3h: Consumptive Use of Water, Giza 178 Rice, 1990 to 1997

Years	Area (Feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Fed. per Day	Total Amount of Water m³
1990	0	135	10	125	4714	37.71	0
1991	0	135	10	125	4714	37.71	0
1992	0	135	10	125	4714	37.71	0
1993	0	135	10	125	4714	37.71	0
1994	0	135	10	125	4714	37.71	0
1995	3,670	135	10	125	4714	37.71	17,300,380
1996	126,570	135	10	125	4714	37.71	596,650,980
1997	295,579	135	10	125	4714	37.71	1,393,359,406

Source: Table B10-1 & MALR

Table B10-3i: Consumptive Use of Water, Giza 177 Rice, 1990 to 1997

Years	Area (Feddan)	Days to Maturity	Days Not Irrigated	Number of Irrigated Days	Consumptive of Water (m³/Fed.)	Amount of Water per Fed. per Day	Total Amount of Water m³
1990	0	125	10	115	4714	40.99	0
1991	0	125	10	115	4714	40.99	0
1992	0	125	10	115	4714	40.99	0
1993	0	125	10	115	4714	40.99	0
1994	0	125	10	115	4714	40.99	0
1995	23,742	125	10	115	4714	40.99	111,919,788
1996	134,069	125	10	115	4714	40.99	632,001,266
1997	168,256	125	10	115	4714	40.99	793,158,784

Source: Table B10-1 & MALR

Table B10-4: Consumptive Use of Water if All Rice Varieties are Long Season, 1990 to 1997

Years	Area (Feddans) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive Use of Water (m³/Fed.) 5	Amount of Water per Feddan per Day 6	Total Amount of Water (b cm) 7
1990	1,036,345	155	10	145	4714	32.51	4,885,330,330
1991	1,099,659	155	10	145	4714	32.51	5,183,792,526
1992	1,214,527	155	10	145	4714	32.51	5,725,280,278
1993	1,281,790	155	10	145	4714	32.51	6,042,358,060
1994	1,377,710	155	10	145	4714	32.51	6,494,524,940
1995	1,400,020	155	10	145	4714	32.51	6,599,694,280
1996	1,405,268	155	10	145	4714	32.51	6,624,433,352
1997	1,549,872	155	10	145	4714	32.51	7,306,096,608

Source: MALR

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B10-5: Consumptive Use of Water if All Rice Varieties are Short Season, 1990 - 1997

Years	Area (Feddans) 1	Days to Maturity* 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m³/Fed.) 5	Amount of Water per Fed. per Day 6	Total Amount of Water (b cm) 7
1990	1,036,345	125	10	115	3739	32.51	3,874,572,331
1991	1,099,659	125	10	115	3739	32.51	4,111,283,728
1992	1,214,527	125	10	115	3739	32.51	4,540,739,531
1993	1,281,790	125	10	115	3739	32.51	4,792,215,013
1994	1,377,710	125	10	115	3739	32.51	5,150,830,125
1995	1,400,020	125	10	115	3739	32.51	5,234,240,291
1996	1,405,268	125	10	115	3739	32.51	5,253,860,934
1997	1,549,872	125	10	115	3739	32.51	5,794,490,413

Source: MALR

Notes: 4=2-3 , 6=5/4, 7=6*1*4

* Days of Maturity assumed for Sakha 102, which has the shortest season.

Table B10-6: Summary of Consumptive Use and Potential Water Savings, 1990 - 1997

(Million Cubic Meters)

Year	Total Consumptive Use of Water, Assuming All Varieties are Long Season	Total Consumptive Use of Water, Assuming All Varieties are Short Season	Potential Savings	Total Consumptive Use of Water Based on Actual Varieties Cultivated	Potential Savings
1990	4,885	3,875	1,011	4,848	(37)
1991	5,184	4,111	1,073	5,126	(58)
1992	5,725	4,541	1,185	5,658	(68)
1993	6,042	4,792	1,250	6,035	(8)
1994	6,495	5,151	1,344	6,488	(7)
1995	6,600	5,234	1,365	6,546	(54)
1996	6,624	5,254	1,371	6,611	(14)
1997	7,306	5,794	1,512	7,278	(28)

Source: Table B10-1 & B10-2

Data between brackets are negative.